THE ARK OF TASTE IN

FOOD, KNOWLEDGE, AND STORIES
OF GASTRONOMIC HERITAGE

Edited by
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THE ARK OF TASTE IN

Tanzania

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OF GASTRONOMIC HERITAGE

Università di Scienze Gastronomiche di Pollenzo
University of Gastronomic Sciences of Pollenzo

Slow Food®

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PREFACE

Carlo Petrini
Founder and President of Slow Food
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Biodiversity is the greatest promise for the future of humankind. Without it, the foundation for human life on the planet is lost, as is the very soil on which civilizations and cultures have been shaped and formed as the result of human adaptation to the natural environment.

Defending, protecting and promoting biodiversity is therefore not simply one among a number of choices, advanced by the intellectuals of conservation or by nostalgic environmentalists: it is, rather, the only viable path forward. It is a moral duty that we, the generation that inhabits this historic moment, must take on for those who will come after us and live on this planet Earth, a planet that, today, we are trampling, hurting, and mistreating. From this point of view, the Ark of Taste, a global project that this book takes up in its Tanzanian context, is an initiative that seeks to create information, knowledge, and awareness about this unique heritage. Through the Ark, not only communities of producers but, dare I say, the whole of civil society, is invited to rediscover and safeguard our agricultural and food heritage, in order to maintain and strengthen our connection to the land that feeds us and will continue to feed us.

Biodiversity is a crucial element for every country in the world and its value should never be underestimated. Nevertheless, I personally think it is even more important to keep this in mind when speaking of a continent like Africa and more specifically of a country like Tanzania: a land full of opportunities but whose history is filled with stories of exploitation. By saying this, I would like to draw to your attention to two dramatic challenges that this part of the world faces. The first one is socio-economic and is related to so-called "land grabbing", the appropriation of big slots of land by foreign multinational companies, in order to grow intensive crops mainly for exportation. This in turn means a reduction of the land that small scale farmers can use to both provide for the needs of their families and also to grow crops that could be sold in the local markets, thus ensuring a source of income. The second major challenge facing us all is environmental: climate change. The two phenomena put together can exacerbate even further the vulnerable living conditions of Tanzanian people, with negative implications on the fulfilment of the right to food, not just at the present time, but also in the years to come. Despite the negative scenario, there is still hope for improvement and this book, in its simplicity, starting from the acknowledgment of the importance of local biodiversity, investigates some possible pathways that could lead to a better future. As an example, I would like to discuss with you the case of traditional leafy vegetables such as *mchunga*, *mgagani*, *mashonanguo* and many others which you will come across while reading this book. Wild leafy vegetables are

a fundamental part of the diet of rural communities all over Tanzania, but a lot still needs to be done before they can gain a good reputation. Just so that you can better understand why I am saying this, you should know that people generally refer to these products with the derogatory term "weeds". But defining them as weeds is profoundly wrong. In actual fact, they are vegetables, and they are beneficial from many points of view: they are highly nutritional, they grow spontaneously with very little or no human intervention, and they are rooted in the lives of the people as part of their culture. I consider all these factors advantageous, and yet they are the same reasons why up to now these species have been relegated to private consumption only, not being considered as valuable enough to be sold elsewhere. It is now time to recognize their worth as a vital and biodiverse source of subsistence for thousands of people, and also extolled for their ability to withstand harsh external conditions. This, among others, is one of the aims that stand behind this volume of the Ark of Taste: not only cataloguing, but also looking for suitable ways to integrate such products into a local value chain. In fact, preserving biocultural heritage and even finding sustainable ways that could make it profitable, are a viable and democratic instruments for improving food sovereignty and more generally, the quality of life for small scale farmers. We have many responsibilities upon our shoulders and we can not cease taking action. We must contribute to the cause.

As global citizens, we should therefore be aware that the gastronomic heritage of a country rests primarily on those people, who, among other things, care for the environment, who keep marginal communities alive, who save soils from erosion, and who protect biological, cultural, and food diversity. As consumers, by deciding to bring biodiversity to our table we can turn into precious allies of the process. The more we consume biodiversity in a sustainable way, the more we transform it into a creative endeavour in order to satisfy our physiological and hedonic needs, the greater the value and the chance for this vast heritage to survive.

Taking care of biodiversity takes us toward a more sustainable future, and a sustainable future for Tanzania and for Africa as a whole represents a hope for the future of the entire planet. Indeed, this publication is intended as a tool to promote Tanzania's biodiversity and make it known to the wider public. Many of the products that you will find in this catalogue are the result of years of work by the Slow Food and Terra Madre networks and later on of extensive fieldwork carried out by the University of Gastronomic Sciences, during which they have met with communities of producers and restaurateurs, collecting stories and testimonies of agricultural and gastronomic knowledge. What you have in your hands is the result of this collective work and it should be understood as an open process that will grow and in which we want to involve anyone interested in safeguarding the food and cultural heritage of this magnificent country. We are at the beginning of a long and fascinating journey of discovery. Great things lie ahead.

INTRODUCTION

Dauro M. Zocchi, Michele F. Fontefrancesco, & Andrea Pieroni
University of Gastronomic Sciences

RESCUING TRADITIONAL FOOD

In the past decades, we have witnessed worldwide a rising political, cultural, and scientific debate on the role that traditional food and local, agricultural products can play in the future of the food system. In the face of the loss of biocultural diversity and its negative consequences, especially on the livelihoods and wellbeing of small-scale rural communities, traditional foods have become the centre of a growing interest of national and international organisations that are involved in rescuing and promoting this important local resource through national and international initiatives.

The Ark of Taste is one of these relevant international initiatives aimed at rescuing, protecting, and promoting local gastronomy. Running since the second half of the 1990s thanks the effort of Slow Food and the University of Gastronomic Sciences, in collaboration with hundreds local associations and communities, the Ark is an online catalogue of foods at risk of disappearing that are part of the traditional gastronomies of the world (more details later in the volume). The project was launched in order to preserve the memories and practices associated with these products, and, in so doing, to support their producers, and, in some cases (such as the case of endangered wild species at risk of extinction), promoting their conservation and reproduction. The Ark of Taste encompasses different products, from fresh to processed foods, which are part of the indigenous gastronomy of over 150 countries. However, the so-called neglected and underutilized species (NUS), also known as orphan crops, have a central place.

NUS encompass a diversity of domesticated, semi-domesticated and wild species whose current production and consumption are limited relative to their economic and dietary potential. While these species are still socially and culturally embedded in the rural and indigenous foodscape, they are gradually losing their importance and have been marginalised due to their inability to adapt to the modernisation and industrialisation of the food and agricultural system. Despite these negative trends, these species have been highlighted as an untapped resource for rural development, and their promotion has been considered a tool for improving the food security and food sovereignty of local communities, whilst simultaneously strengthening environmental and social resilience and safeguarding the traditional knowledge and heritage tied to these communities.

THE ARK OF TASTE ATLAS

Building upon this understanding, this volume presents a selection of 50 traditional products from Tanzania, which encompasses animal breeds, plant species and artisanal processed products. The selection of the 50 products was undertaken by the researchers of the University of Gastronomic Sciences, in collaboration with the members of Slow Food Tanzania. This gastronomic treasure represents a fundamental contribution to understanding and appreciating the richness of Tanzania's food and biocultural heritage, and to protecting this natural and cultural wealth, beginning with the rediscovery and promotion of sustainable productive and cultural practices.

In this work, particular attention is given to Tanzanian NUS, considered a positive and promising resource for farming and rural development of the communities of this important East African country. This aspect of the Tanzanian gastronomy has been at the centre of a multidisciplinary research conducted between 2017 and 2020 by the researchers of the University of Gastronomic Sciences, in collaboration with Tanzanian and international institutions within the Sustainable Agri-Food System Strategies (SASS) project. The research aims to offer the theoretical and methodological tools to promote the production, marketing, and consumption of the NUS in Tanzania. In the first part of this volume, the contributors present the project and the results of the research that concentrated upon three key locations: Arusha, in northern Tanzania, and Iringa and Dodoma in southern and central parts of the country.

This Atlas is one of the volumes produced by the University of Gastronomic Sciences within the project in order to provide greater visibility, at local and international levels, to the local food and gastronomic heritage of the country.

THE CONTENTS OF THE VOLUME

The volume is divided into three sections.

The first section presents the SASS project and the outcomes of the research concerning the role of NUS in the Tanzanian food and restaurant sector. Specifically, Paolo Corvo introduces SASS, its objectives and the role played by the University of Gastronomic Sciences. Then Cecilia D'Alessandro and Paulina Bizzotto Molina, from the European Centre for Development Policy Management (ECPDM), present the outcomes of the activities carried out to identify pathways to better integrate indigenous vegetables into the food systems of the Arusha and Iringa areas. John M. Msuya discusses the crucial dietary and social role that traditional leafy vegetables have for the subsistence of communities in rural Tanzania, by presenting a case study on the Kalenga Village (Iringa). Marta Marson and Gianni Vaggi analyse the farmer/trader relationship within the food market, by considering competition and buyer power, and the efficiency of the value chain of leafy, mostly indigenous, vegetables. Finally, Michele F. Fontefrancesco and Dauro M. Zocchi explore the role of NUS in the restaurant sector and the dynamics regarding the potential and demands of local and traditional food products and dishes.

The second part of the book presents the 50 Ark of Taste products. They are organised into chapters according to product category. For each one, we provide a brief description that explores several aspects of the product: its physical and sensory characteristics, its ecology and processing (i.e., means and places of production), its culinary uses, as well as the way it is embedded in the culture and history of Tanzanian people, through ritual and medicinal uses. Finally we explore the dynamics which are putting some products at risk. Although very concise, the product descriptions help the reader to understand the complex web of social, cultural and economic relations that surround a given product while also highlighting how endogenous or exogenous changes have heavily shaped the very survival of these resources, with the risk of losing its associated heritage.

The final part of the book provides more details about Slow Food, the University of Gastronomic Sciences and the Ark of Taste project.

THE SASS PROJECT
(SUSTAINABLE AGRI-FOOD SYSTEM STRATEGIES)

Paolo Corvo
University of Gastronomic Sciences

The SASS project, funded by the Ministry of Education, University and Research (MIUR), aims to strengthen the relationship between agro-biodiversity, conservation, nutrition, and health in sub-Saharan Africa. Working with local stakeholders, the project aims to develop strategies and policies to promote local supply chains in order to make them more sustainable and efficient.

It involves the participation of four Italian universities (University of Milan Bicocca, University of Cattolica, University of Pavia, and University of Gastronomic Sciences) in collaboration with the Dutch European Centre for Development Policy Management (ECDPM). In addition to these, there are local partners, such as the Naivasha Basin Sustainability Initiative (NBSI), Oikos, Kenyatta University, Nelson Mandela University, the Network for Ecofarming in Africa (NECOFA), and Slow Food Convivia and Presidia in Tanzania and Kenya.

The project promotes the production, marketing, and consumption of neglected and underutilised species (NUS), also known as "orphan crops" (Padulosi et al., 2013). These wild species, varieties, and ecotypes are widespread in the Global South but rarely traded internationally, and studied and economically exploited only to a limited extent (Gruere et al., 2007). Interest in NUS arises from the fact that their role in ensuring food security and food sovereignty in traditional agricultural systems, preserving biodiversity, and generating income and employment for local communities is widely recognised (Will, 2008; Jaenicke and Hoeschle-Zeledon, 2006). Nevertheless, these species are not developed to their full potential due to a lack of awareness about their real value and the difficulties that local and international populations face in marketing them.

Overall, the project aims to offer theoretical and methodological tools to promote the production, marketing, and consumption of neglected and underutilised species in three key locations: the Arusha Region in northern Tanzania, the areas around Iringa and Dodoma in southern and central Tanzania, and the southern Nakuru County in Kenya. Specifically, it addresses the social, environmental, economic and institutional/political sustainability aspects in each region, with a special focus on different policy outcomes and specific recommendations in the three different areas.

Since 2018 the University of Gastronomic Sciences of Pollenzo, as part of the SASS project, has been carrying out anthropological and ethnobotanical analysis aimed at documenting local, traditional food products (i.e., vegetal, fungal and animal species as well as artisanal processed products) and the practices associated with their production, trade and consumption. Adopting an interdisciplinary approach, the research explores the presence of selected products in local markets and the restaurant sector and identifies the drivers that support or inhibit their demand and supply. Overall, the research wants to shed light on the social and cultural roles and dynamics tied to food products that are strongly embedded in their local context, as well as on the factors that undermine the sustainability of these local resources. In so doing, it will offer a gastronomic sciences-centred approach and guidelines that can help policy-makers, development institutions and NGOs in the design and implementation of strategies aimed at safeguarding and promoting local food and biocultural heritage and related knowledge, making it a potential asset for the future development of the community.

With these aims in mind, the food-scouting activities carried out in the field allow the University of Gastronomic Sciences to support and implement the activities of the Ark of Taste, an initiative managed in collaboration with the Slow Food Foundation for Biodiversity that works to document and promote traditional, endangered food products. The selection and cataloguing of products, completed by researchers from the University, was made possible thanks to collaboration with the local members of Slow Food Tanzania. The work of the University has allowed Ark of Taste products to gain greater visibility at local and international levels, and has deepened the study of local gastronomic heritage by identifying traditional, previously undocumented, products to be preserved.

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STRENGTHENING THE ROLE OF INDIGENOUS VEGETABLES IN LOCAL FOOD SYSTEMS IN TANZANIA

Cecilia D'Alessandro & Paulina Bizzotto Molina
European Centre for Development Policy Management

INDIGENOUS VEGETABLES PLAY A CRUCIAL ROLE IN THE SUSTAINABILITY OF TANZANIAN FOOD SYSTEMS

Indigenous vegetables, which include both the vegetables native to Africa as well as those with a long history of cultivation and domestication to African conditions (Ambrose-Oji, 2009), hold great potential to remedy some of the unsustainable outcomes of food systems in Arusha and Iringa – respectively a large and a medium-sized city in the north and centre of Tanzania. Despite being national breadbaskets, these two regions still face high levels of malnutrition and poverty, while pressure on natural resources and close-by conservation areas increases. The researchers that took part in the Sustainable Agri-food Systems Strategies (SASS) project identified four concrete pathways to better integrate indigenous vegetables into the food systems in these areas.

Local communities in Arusha and Iringa, together with policymakers and development partners, work every day to improve agricultural production and trade, including making roads more accessible, improving storage facilities and investing in organisations and institutions. But achieving long-lasting change on these different fronts is not easy. Challenges are interrelated, and disagreement on what needs to change and how is the rule rather than the exception. Taking a 'food systems approach' and applying a political economy lens can help unravel these complex and context-specific dynamics that, together with a number of other issues, help or hinder change towards more sustainable food production, distribution, trade and consumption. Policies and practices need to become more responsive to the needs, interests and incentives of small-scale producers, traders, food vendors and other – often marginalised – food system stakeholders, if Tanzanian food systems are to better support rural livelihoods, a resilient natural environment and healthy communities.

BOX 1:
The Sustainable Agri-food Systems Strategies (SASS) project

SASS is a multidisciplinary research project funded by the Italian Ministry of Education, University and Research (MIUR) and involving the participation of the European Centre for Development Policy Management (ECDPM), the University of Milano-Bicocca (UNIMIB), the Catholic University of the Sacred Heart (UNICATT), the University of Pavia (UNIPV) and the University of Gastronomic Sciences (UNISG). Between 2017 and 2020, the SASS researchers contributed to building knowledge, policy dialogue and partnerships around sustainable food systems in the Arusha Region in northern Tanzania, the areas around Iringa and Dodoma in southern and central Tanzania, and in the southern Nakuru County in Kenya. In Tanzania, SASS researchers worked together with many local organisations including Oikos East Africa, Sokoine University of Agriculture, Slow Food Tanzania, MWEKA,the World Vegetable Centre and AgriProFocus Tanzania.

More information at hiips://ecdpm.org/sass

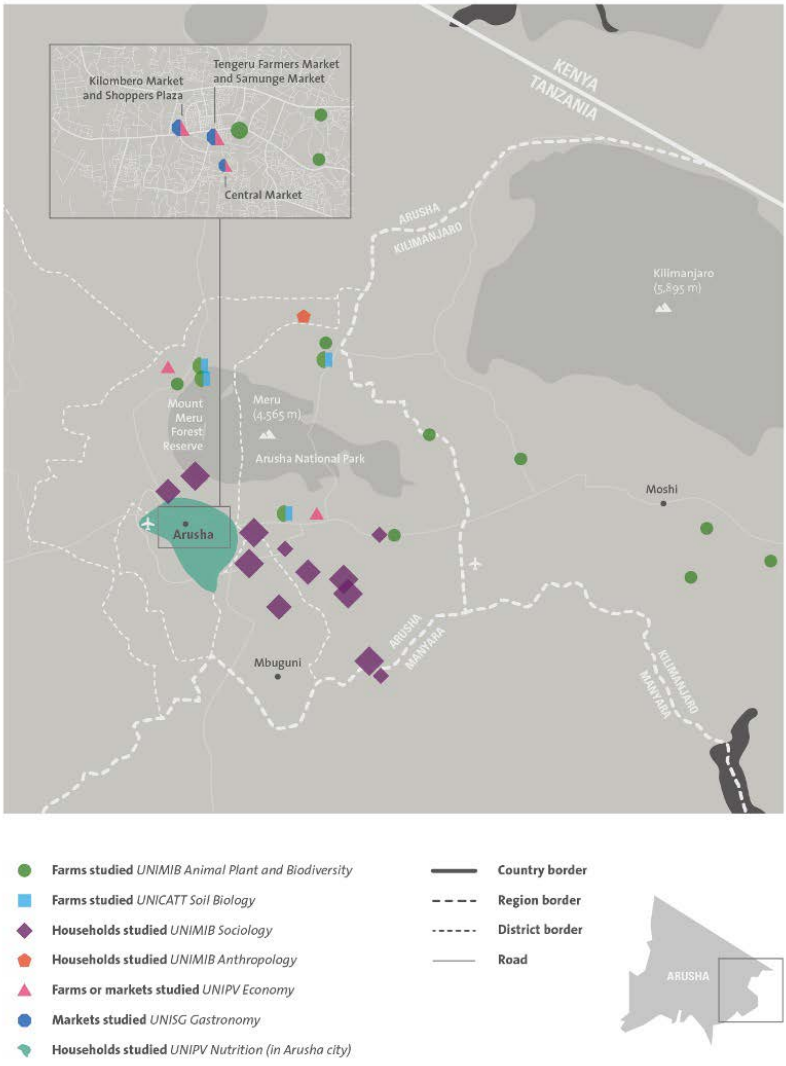

FIGURE 1: SASS RESEARCH LOCATIONS BY DISCIPLINE IN ARUSHA, TANZANIA

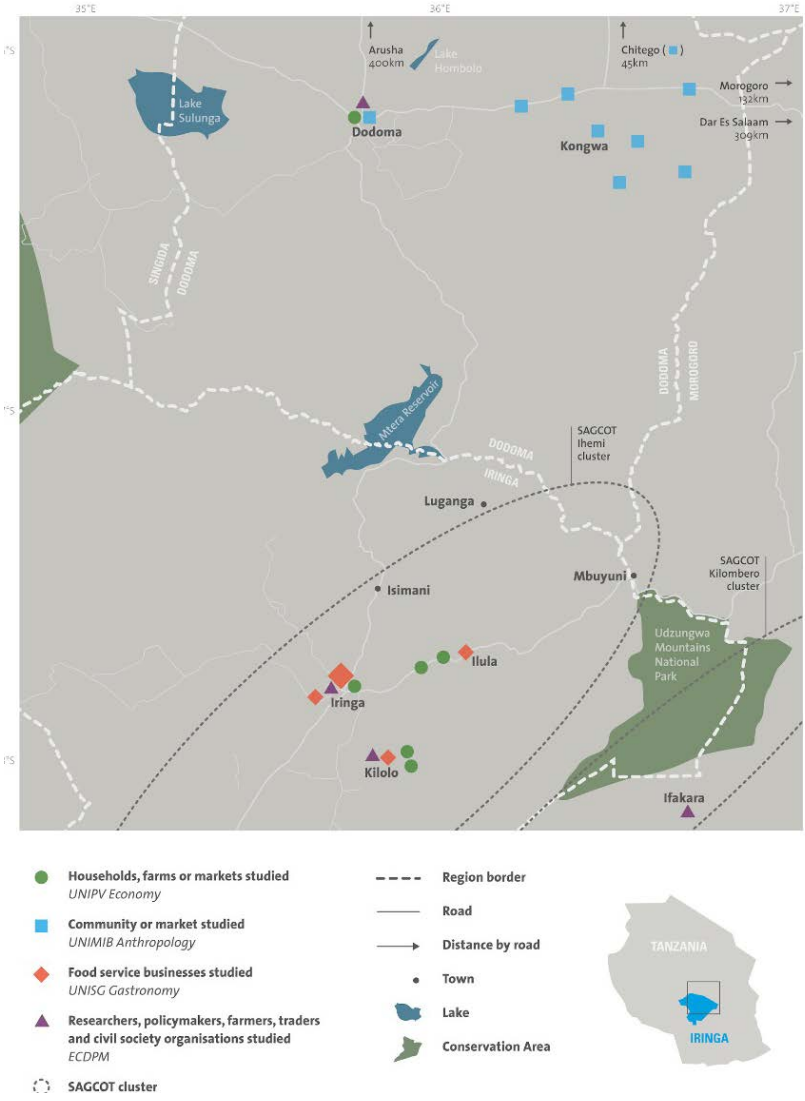

FIGURE 2: SASS RESEARCH LOCATIONS BY DISCIPLINE IN IRINGA, TANZANIA

MAPPING THE FOOD SYSTEM IN ARUSHA AND IRINGA

Food systems, meaning "*all elements and activities that relate to production, processing, distribution, preparation, and consumption of food*" (Willett et al., 2019), play a central role in providing food, jobs and revenue in Tanzania. As part of the SASS project, researchers from the European Centre for Development Policy Management (ECDPM) used a 'food system approach' that looks at how economic, socio-cultural, environmental and political drivers shape the main activities of a food system. In Tanzania, they found that a number of policies are in place to support sustainable food system outcomes – for example, nutrition committees involving multiple ministries and stakeholders, or regulations regarding food safety and environmental protection – but often they are weakly implemented or not enforced at all (Bizzotto Molina et al., 2020). Many of the food system activities are informal, especially within the indigenous vegetables value chain. Support structures, such as extension services and the formal financial infrastructure, often fail to take into account the dynamics between – and incentives of – different informal food system actors. Interventions from both government and development partners would be more effective if they became more responsive to the interests of marginalised food system players, and involved them actively in the design and implementation of activities. But how are these national dynamics reflected at the local level?

In Arusha, the mountain slopes of Mount Meru provide fertile soils for small and medium-sized farms to produce crops and livestock. Relatively constant water availability characterises both Arusha and Iringa food systems, creating favourable conditions for the production of a variety of crops. While the larger horticulture companies in both regions cater to regional and international markets, most small and medium-sized farms produce for local and regional markets, as well as for home-consumption. Livestock is an important source of livelihoods, both in Iringa and Arusha. The lack of sustainability of the food systems in both regions is reflected by the high levels of malnourishment, often due to a lack of dietary diversity, while unsustainable agricultural practices contribute to declining soil fertility. The consequences of climate change – such as erratic weather patterns, droughts and floods – amplify these problems, and social norms and institutions, such as the current tenure system, put women in a disadvantaged position.

Diversification in consumption and production systems, but also in the types of interventions and actors involved in policy-making, can positively contribute to the food systems in Arusha and Iringa. The project focuses on the role that indigenous vegetables play in these specific systems and how they can contribute to increased sustainability. Because of their particular characteristics – often highly nutritious and well-adapted to local conditions, some drought-resistant (Dawson et al., 2018; Padulosi et al., 2019) - indigenous vegetables can support the inhabitants of Arusha and Iringa whilst also improving their livelihoods, making their diets healthier, reducing the reliance on external farming inputs and making production systems more resilient (Mabhaudhi et al., 2018).

After mapping the main drivers and activities of the food systems in Arusha and Iringa, and assessing the sustainability of the local food systems, the researchers analysed the power dynamics in the national and local food systems. They looked into formal policies and regulations relevant to food and agriculture, as well as at informal 'rules of the game' that

shape how policies play out in practice. They found that, while indigenous vegetables are present in the plot, market and on the plate, they are largely absent from policy.

The results of the research reveal that the policies that govern the Tanzanian food system are often fragmented and sometimes incoherent. Despite high ambitions to take an integrated approach in agricultural and nutritional policies, taking into account many different sectors and actors, the government's rhetoric of prioritising agriculture for economic transformation is not matched by strong public investment in the sector. Vested interests and dominant narratives that over-emphasise productivity increase reliance on external farming inputs and the formalisation of food value chains make it hard to transition to more inclusive, resilient and sustainable food systems.

The results of the SASS research pointed out that the integration of indigenous vegetables into local food systems in Arusha and Iringa is hindered by different factors. The high perishability of leafy vegetables and the low level of processing are major constraints, requiring efficiency in transport and storage. Extension services, policies and subsidies tend to neglect indigenous vegetables and mainly target staples and export crops. Misuse of agrochemicals is widespread and the promotion of more sustainable agricultural practices is not well tailored to the local context, which would increase their adoption by small-scale producers. Organisations of farmers, traders and consumers should be strengthened to boost their position in policy processes and increase bargaining power in the value chain. The low level of awareness of consumers – stemming from a lack of nutritional education, but also cultural notions around (indigenous) vegetables – is a barrier to healthier, more diverse diets.

In collaboration with local stakeholders, the researchers identified several entry points for stronger integration of indigenous vegetables into local food systems.

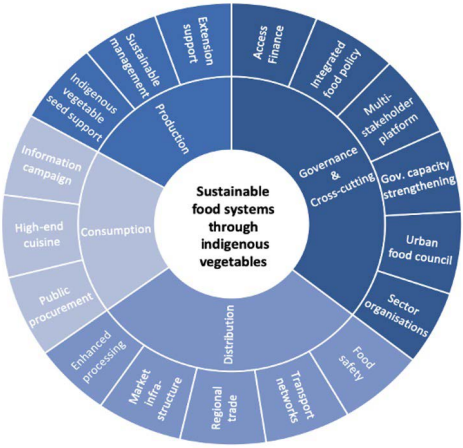

FIGURE 3: ENTRY POINTS TO IMPROVE THE ROLE OF INDIGENOUS VEGETABLES IN ARUSHA'S FOOD SYSTEM (SOURCE: BIZZOTTO MOLINA ET AL., 2020)

These entry points were developed into 'pathways for change' by analysing their advantages, disadvantages, synergies, trade-offs, key stakeholders and actors, and the potential future support of the SASS consortium. The four pathways are:

1. Strengthen extension services support for indigenous vegetables, by including them in officers' curricula, to better support farmers in their farming management choices (a pathway focusing on production drivers)
2. Improve food safety and reduce loss along the chain, by designing strategies to promote safer practices while taking into account the informal part of the indigenous vegetables value chain – such as informal traders' networks (focusing on distribution drivers)
3. Develop information campaigns to enhance food knowledge about indigenous vegetables and provide nutrition advice that can lead to more adequate diets (focusing on consumption drivers)
4. Create a multi-stakeholder platform, including informal actors, to develop shared solutions and coordinate support for indigenous vegetables value chains (focusing on enhancing governance at the systems level). This platform can act as a conduit to design and facilitate action plans – for example, to improve food safety along the indigenous vegetable chain.

LOCAL CHAMPIONS AND PROMISING PROCESSES

By taking a participatory and action-oriented approach, the SASS project tried to actively contribute to the creation of knowledge, policy dialogue and building partnerships at the local, national and international levels. The participants in a workshop in November 2020, which concluded the project's work in Arusha, agreed that many of the insights obtained and pathways developed in the SASS project, fit well within the *Arusha Food Smart City Initiative*, promoted by the Belgian NGO Rikolto under the leadership of the Arusha City Council. The initiative brings together several partners with a common goal: ensuring that all the food consumed and produced in Arusha is affordable, safe, nutritionally adequate and produced with respect to biodiversity and ecosystems food production. Together, they will take steps to include indigenous vegetables within the scope of the initiative platform, building on the knowledge and partnerships fostered by SASS in Tanzania.

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WILD TRADITIONAL LEAFY VEGETABLES IN KALENGA VILLAGE, IRINGA

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INTRODUCING MAIMUNA - A LADY IN KALENGA

Maimuna is a 40 years old woman living in Kalenga village. She has spent most of her lifetime there, where she was born, grew up and got married. Kalenga village is situated in Iringa District, which is among the four Districts of Iringa Region in the south-western part of Tanzania. The village has historical significance in Tanzania.. It is the place where the famous Chief Mkwawa of the Hehe tribe had his residence. He is known for fighting the German colonial expansion during the colonial era. The old town of Kalenga was stormed by a German force in 1894 and the fortifications destroyed, but Chief Mkwawa continued to resist until 1897 when he was finally hunted down by the Germans and committed suicide. His head was cut off and sent to Germany but was returned in 1956. The skull is now on display in a small museum in the village. Kalenga is currently a good tourist destination because of its history.

It is now the month of April, the time of the year when Maimuna and her children have to wake up early in the morning and go to weed their farm plot, which is situated about 30 minutes' walk from their house. At this time of the year it is very common for children to miss school classes because they are helping their families tend to their fields of maize and beans. While the other members of family will begin weeding once they get to the field, Maimuna has to first ensure that she has picked some leafy vegetables to cook for the evening meal. She has a choice of picking among six commonly found traditional wild leafy vegetables in the area. The vegetables include *mashonanguo* (Black jack), *mlenda* (*Corchonus trilocularis*), *ndelema* (Malabar spinach), *mgagani* (Spider plant), *mchunga* (Hare lettuce), and *mnavu* (Black nightshade). It is a custom that these vegetables have to be picked first thing in the morning. While there is no clear explanation as to why the vegetables have to be picked that early in the morning, some local people believe that such vegetables are fresher in the morning, and therefore more nutritious. Some believe that the sun will make them shrink, and therefore reduce in volume. However, a good explanation could be that as these vegetables are not planted, but rather grow as wild weeds that will later be removed (uprooted and destroyed), they therefore have to be picked early, before they are removed and discarded during the weeding process. Quite a good reason for picking them early!

Maimuna has got two daughters and a son. The daughters are the elder children, the first one is now 16 years old and the second one is 14, while the only son is 12 years old. Thanks to the recent Government policy of free education, the eldest daughter goes to one of

the few secondary schools in the area, which is shared among several villages. The other children attend the nearby primary school, which serves most of the kids in the area. Like most men in the area, her husband Mr. Mtono has another wife, and therefore he maintains two families in separate compounds within the village. The other wife has four children. Mr. Mtono has divided his 4 acres plot equally between his two wives: each has received 2 acres of land to farm and grow sufficient food to feed her children. As in most parts of Iringa, land ownership is dictated by customary laws, under which control over land (decisions on how to use, and sell) is dominated by men (Sikira & Kashaigili, 2017). Women normally access land through their husbands. Once a woman is provided with a farming plot, it is not mandatory for the husband to join the wife in day to day farming activities. He may choose to accompany the family once in a while, especially during land preparation or harvesting time - but for Mr. Mtono that rarely happens, he believes that his two wives are capable of supporting his children. He only provides money for buying school uniforms and books, and pays for medical treatment when need arises. Mr. Mtono spends much of his daytime running his small shop near the market place in Kalenga while the nights are divided between his two homes.

COLLECTING WILD LEAFY VEGETABLES IN KALENGA

Like many other women in Kalenga, and perhaps much of the Iringa Region, Maimuna learnt most necessary household skills, including gathering of the traditional wild leafy vegetables, from her parents as she was growing up. She knows the best time of the year to gather a particular vegetable, and how it should be processed and cooked. The good thing about these so-called 'wild vegetables' is that they can be gathered without having to worry about ownership of the farm plot because they are considered weeds in the crop fields. It is generally acceptable that anyone can pick them provided they don't touch the cultivated crops. While mchunga, mashonanguo, mgagani and mnavu have to be harvested at the tender stage (before flowering), the leaves of mlenda and ndelema can be picked over a much longer period. In that respect, Mainuna knows very well when she should give preference to the former four vegetables as they will overgrow much earlier after the first rains. The latter two can still be collected even at later stage when the rains have stopped. Actually, given the plant characteristics of ndelema, especially being perennial in nature, it can be harvested throughout the year. This has led to a saying in the area that "*... in the household everything can run out, but not ndelema...*", implying that it is a resilient plant that people can depend upon when they face difficult moments of food shortage.

THE COMMON WILD VEGETABLES OF KALENGA - AND THEIR PLACE IN THE TANZANIAN DIET

In an attempt to promote the reintroduction of indigenous vegetables into the Tanzanian diet, a group of highly innovative women known as the Regent Senior Women's Group (RESEWO), working in collaboration with the Slow Food Foundation Biodiversity organization, has written a recipe book about some of the indigenous vegetables

consumed in Tanzania[1]. The book includes many vegetables found in Kalenga. Descriptions of each of the above-mentioned wild leafy vegetables consumed in Kalenga Iringa are given here based on the RESEWO Book.

Mgagani (Spider plant) - grows wild in the tropics and is well established in the highlands with rainfall of more than 500 millimeters. The vegetable can be found in Tanzania's markets, but it is only available in small quantities as it is not cultivated by farmers. It is used as an edible leafy vegetable by rural communities across Tanzania and East Africa. To soften its bitter taste, it is usually mixed with other vegetables, such as flame flower, wild spinach, pumpkin leaves or black nightshade.

Mashonanguo (Blackjack) - a wild herb that grows well on highlands and tropical areas with high rainfall. It grows spontaneously in cultivated areas, wastelands and forests. It can be found across Tanzania. It is used as an edible vegetable, and is also used as a medicine, fodder, in herbal tea and as a spice. The leaves are also used to prepare blackjack tea and juice. Despite the variety of uses, some communities still view the plant as a weed only.

Mchunga (Hare Lettuce) - a common weed found in agricultural fields, especially abundant during the rainy season, which is able to grow in a wide variety of soils, from rich humus to sandy ground. A well-known indigenous vegetable that is eaten widely across Tanzania and can be found in the markets in plentiful supply during the rainy season. It is particularly popular in the eastern costal areas.

Mnavu (Nightshade) - commonly found growing as a weed in agricultural fields in the tropics, this evergreen, short-lived shrub only grows during the rainy season. It is well established in the areas where the rainfall is more than 500 mm. It is widely used as a vegetable by rural people in Tanzania and East Africa. The plant can be dried to preserve it for non-fresh applications, including medicinal uses.

Wild *Mlenda* - grows spontaneously in almost all the regions across Tanzania and grows particularly well in tropical forests. Mlenda is a popular vegetable collected from the wild for home consumption and for sale at local markets. It is only rarely cultivated on a small scale.

Ndelema (Malabar spinach) - grows in almost all regions of Tanzania, especially in Kilimanjaro, Arusha, Tanga, Mbeya, Iringa, Ruvuma, Morogoro and Dar es Salaam. It is a climbing plant, which grows spontaneously in forests, bushland and farmlands, provided there is a rich enough soil and available water. It grows best in a cool to moderate climate. The plant is now also cultivated and sold in the marketplace to some extent.

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RECOMMENDATIONS AND WAY FORWARD

It is important to consider promoting cultivation of these leafy vegetables, which are still considered as mere weeds in many parts of the country, including Kalenga Village in Iringa. Considering the ease with which these plants grow spontaneously, it is likely that they can be quite resilient to the harsh environmental conditions, including those brought about by climate change. It is also true that such leafy vegetables are gaining importance as potential market commodities, which can serve as crucial source of income for women like Maimuna in Kalenga, who have very limited means of earning income for their families.

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INDIGENOUS LEAFY VEGETABLES TRADERS IN LOCAL HORTICULTURAL MARKETS OF TANZANIA

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INTRODUCTION

Increasing agricultural productivity is now considered a main strategy for African development (African Union, 2015), but it is usually recognised that agriculture alone can't provide decent employment for the booming population of African youth. Africa will have to develop jobs outside farming, and emphasis has now been moved from crop production only to a broader notion of food systems, whose development can increase agricultural productivity, add value, and, of course, improve nutrition. On the demand side, opportunities are there: the growing urban middle class has new consumption patterns and increasingly demands non-grain foods, like dairy, fish, meat, vegetables, fruit, tubers, and processed products (Tschirley et al., 2015). While the rhetoric of entrepreneurship is lively and widespread, there seems to be a lack of initiatives targeting food traders. Understanding local value chains and traders' business models is necessary to improve their efficiency and development which, in turn, are expected to improve the welfare of all the actors involved, including farmers and consumers.

Based on original research carried out in Tanzania regarding the value chains of leafy, mostly indigenous, vegetables we show that traders connecting rural and urban areas, often referred to as middlemen, play an important role, with trickle-down effects on farmers and urban consumers. While literature about market access tends to associate trade intermediaries buying at the farm-gate with market imperfections, rent positions, and inefficiency, we stress the importance of distinguishing between different markets and value chains.

LITERATURE REVIEW

Supporting business development is a first priority for the transformation of African agriculture and for agro-based industrialisation, but food traders and middlemen are seldom considered. There is considerable literature about the need to provide farmers with market access, often intended as direct market access thus bypassing traders and middlemen. The main problems with commercial intermediaries seem to be the lack of competition at the farm-gate and the high number of intermediaries downstream the value chain, further eroding farmers' margins.

However, direct access by farmers is not exempt from challenges, like transport and infrastructural constraints and gaps in the technical and human capacity of farmers to handle these tasks, like marketing skills. Moreover, farmers have seldom benefited from

direct selling of undifferentiated commodities sold on the spot or at wholesale markets and perishable food products carry a high risk because they require storage and transportation facilities and technical expertise beyond the typical famers marketing and coordination capacity.

Narratives about direct market access are applied to most products and literature discussing potential biases against traders is instead surprisingly scant. Sitko and Jayne (2014) argue that small-scale assemblers are both the most vilified and least understood actors in food value chains in Sub-Saharan Africa. They find assembly markets for maize to be highly competitive and that farmers' market-access conditions in remote areas in particular are improved by the operation of traders.

Examples of the direct market access narratives can easily be found even in the sector of leafy indigenous vegetables. Ngugi et al. (2007) analyse how farmers in the value chain of indigenous vegetables in Kenya were supported by an international NGO to get direct access to supermarket and bypass middlemen and traders. Similarly, Muhanji et al. (2011) report about a project in selected districts of Kenya and Tanzania to promote indigenous vegetables and their collective marketing by farmers. For this purpose, business support units were created and the project promoted direct selling to formal high value outlets, i.e. supermarkets, by farmers directly. Nonetheless, the need for middlemen is implicitly recognised because the project relied on intermediaries, buying at the farm-gate or at collection centres, for informal, lower value, markets: here margins are probably too low to cover the costs of direct access by farmers.

Our fieldwork assesses the nature of the farmer/trader relationship, by considering competition and buyer power, and the efficiency of the value chain of leafy, mostly indigenous vegetables.

FIELDWORK METHODOLOGY AND FINDINGS

The work is based on fieldwork in Arusha Urban, Rural, and Meru Districts (Arusha Region of Tanzania), Dodoma Urban District (Dodoma Region of Tanzania) and Iringa and Kilolo Districts (Iringa Region of Tanzania) in 2019. Information was collected with qualitative and participatory methodologies, including market and farms transect visits, interviews with key informants (market directors and chairmen, officers of the chambers of commerce, Municipal Council officers, agricultural extension officers), value chain mapping focus groups with farmers, simplified farm balance sheets, individual interviews and focus groups with traders. Our main focus is on farm-gate buyers, who are wholesalers in most cases. The fieldwork confirmed findings from previous literature about the importance of perishability in determining the features of the value chain of leafy vegetables and that transport is limited to nearby markets (Lotter 2014).

Moreover, our fieldwork provided insights about:

- Competition at the farm-gate, as measured by the number of traders per area and per farmer, and the trader/farmer relationship;
- Efficiency of traders, which is largely driven by the perishability of the produce and by the risk of post-harvest losses.

Traders are mainly women in the wholesale stage of the value chain, and exclusively women in retail. The majority of farmers prefer farm-gate buyers because this option reduces risks. Farmers reported that there are different buyers visiting each of the areas. Buyers in some cases use small trucks, but mostly they collect the produce from farms by motorcycle taxi, donkeys or carrying the vegetables on their heads. Collection in Arusha is often performed by *boda-boda* drivers, who collect the products alone and transport them, by motorbike, to traders, who wait in the wholesale markets. This provides an example of noticeable coordination effort, which implies some management and logistic skills. From the tarmac road *bajaji* taxies, *dala-dala* minibuses and buses are used. Once the market is reached, traders have to pay market fees and engage urban youth who carry the bags and, in bigger markets, sometimes operate as brokers for buyers. We could not find aggregation or assembly markets for leafy vegetables. Virtually no leafy vegetables are sent to other counties and regions. Due to perishability, traders who buy indigenous vegetables at the farm-gate in the afternoon must take the produce straight to the wholesale market the next day before sunrise, in the area where the produce will be consumed. This arrangement, without intermediate steps, is due to the perishability of leafy indigenous vegetables, which forces traders to limit the number of links in the value chain, in order to ensure timely delivery. In this sense the value chain studied is short and efficient, and does not show the high number of intermediaries, or middlemen that is sometimes blamed for jeopardizing efficiency of African markets.

In peri-urban areas, traders book the produce in advance, with an unwritten contract with the farmers. Contact between the farmer and the selected trader is frequent thanks to mobile phones, through which the traders coordinate their suppliers. Farmers are usually paid only an advance sum at harvesting time while the final payment is made after the produce has been sold by the trader, due to liquidity constraints. Even if farmers have many options, a kind of loyalty by the farmers to a preferred trader was found, where the farmer is expected to offer vegetables at a better (i.e. lower) price to the trader in question, than to others. At any time, the farmer can decide to sell to other traders who pass by the area to visit other farmers offering higher prices, but this affects mutual trust. Mutual trust reflects in facts the commitment by the farmer to sell to the traders and, by the trader, to come and collect the harvest promptly. If the trader does not come, farmers bear the risk of post-harvest losses, which is otherwise fully transferred to the trader. Seasonal oversupply and huge post-harvest losses are important for most leafy vegetables, in line with recent studies (Lotter, 2014).

Direct access by farmers to markets was found to be negligible. Farmers themselves reach out to markets to sell only when farm-gate buyers are not available, which might happen

when the price is very low. Farmers can also sell in retail in their respective neighbourhoods, but this trade accounts for a small share of the total due to the low volume demanded.

Marginalized food and marginalized traders: a comparison with markets places for exotic vegetables in 3 cities

Tanzania and East Africa in general have a number of leafy vegetables which are traditionally eaten cooked with the local white maize porridge, *ugali*. Every area and group has its own specific vegetables, or similar vegetables with different local names, but everywhere *ugali* is expected to be served with some leafy vegetables, mboga. As often happens however, instead of being proud of such traditions, locals relegate such food to a private, female centred, domain, which gets no recognition in the public space and local decision making. This idea, of neglected local food, is supported by the physical and organisational arrangements found in wholesale vegetable markets we visited in Arusha, Dodoma and Iringa.

In Dodoma, the wholesale market for greens is *Saba Saba* market. Wholesale of green vegetables used to take place in *Majengo* market, before the market was upgraded and renovated around six years ago. At that time greens traders were given a space in *Maisha Plus* market, but, due to the remoteness of this market, they prefer to use the busy and central *Saba Saba* market. In Saba Saba however, they don't have a dedicated space for leafy vegetables and, from 8 a.m., the area they use is occupied by second-hand shoe traders, so that when the boys who sell shoes come, the ladies have to leave, with their leftover vegetables.

All the urban markets in Iringa sell indigenous leafy vegetables, but wholesale is only carried out in *Kitonzini* market. Here there is a dedicated, yet informal, area for leafy vegetables, along a steep slope and without any sheds or pavements. Women bring their baskets before sunrise and the area is then abandoned later in the morning. Wholesale traders of other vegetables enjoy dedicated spaces in *Machine Tatu* market, which is easily accessible by vehicle, and where wholesale activities continue throughout the day.

In Arusha, *Samunge* is the main wholesale market for leafy vegetables. There is a dedicated area, without any sheds or pavements, where women traders bring their bags before sunrise. The same area becomes a retail market for vegetables during the day. Other produce enjoys a dedicated space for wholesale, so that activities can continue throughout the day. This is the case for example for tomatoes and cabbages, which are considered exotic vegetables in Africa, in Kilombero market, where a dedicated and paved shed is available. Here, one can see male traders sleeping on their cabbages under the shed, which stands in sharp contrast with ladies rushing to the markets with their bags of leafy vegetables before sunrise.

CONCLUSIONS

Based on the analysis of indigenous vegetables in parts of Tanzania, we find that relationships along food value chains are more articulated and complex than some prevalent interpretations. Traders do not necessarily occupy a rent position, nor they take advantage of a market power which endangers the efficiency of the whole chain. The relationships between farmers and traders have to be investigated in the specific contexts and can present several advantages to both groups.

The analysis has shown that the local markets of indigenous leafy vegetables, in which traders buying at the farm-gate play a main role, are characterized by a certain degree of competition and efficiency. Competition is ensured by the presence of alternative buyers in all the areas looked at in this study, and efficiency is a necessary condition, with one single trader handling the produce from the farm-gate to the wholesale market. Moreover, traders were found to bear high risk because of perishability of products, combined with the challenging conditions of roads and transport. These considerations point to the complexity, to the skills, and in a sense to the dignity of the role performed by traders, who are mostly women. Direct access by farmers to local urban markets of leafy indigenous vegetables is seldom found because it is simply a worse solution. While high value market outlets like supermarkets might repay farmers' organisation for the extra costs of direct market access, local markets do not.

The role played by small traders is important for sustainable food value chains, whose efficiency and development are necessary for agricultural transformation. We extend findings by Sitko and Jayne (2014) to a value chain which is very different from that of grains and where the need for specialised businesspersons to connect production and markets is further stressed by the perishability of the produce and by the low total margins available, which expose these informal entrepreneurs to high demand risk.

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A PILLAR FOR ANY MENU
PERSPECTIVES AND CONSTRAINTS IN THE DIFFUSION OF TRADITIONAL FOODS IN THE RESTAURANT SECTOR

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What is the role of traditional foods in the Tanzanian public foodscape? What are the drivers that sustain their success and encourage their spread throughout the country? These questions are crucial to understanding the future of the Tanzanian foodscape, to designing effective policies for sustaining the production of local foods, and as such promoting forms of sustainable farming that are embedded in the agricultural practices of the place. This chapter provides answers to these questions, based on research conducted in Tanzania between 2018 and 2020.

In the past twenty years, the academic and professional debates have widely discussed the transformation of food systems and the dramatic worldwide erosion of agrobiodiversity. In particular, the change coincided with the marginalization and abandonment of local crops and the consequent loss of food and cultural heritage. Nowadays the rediscovery of endangered and marginalized foods is at the centre of several national and international projects (Padulosi et al., 2013). At the same time, the growing demand for such products marks the current development of the food market worldwide. The success of this endeavour depends on several different factors, expressing specific motivations that may vary from country to country. In Eastern Africa, one of the key factors is an emerging demand for healthier and more natural products (Gakobo & Jere, 2016; Zocchi & Fontefrancesco 2020; Cernansky, 2015). Despite some recent research, however, the dynamics in the region and, in particular, in Tanzania are still to be fully investigated.

In order to partially fill this gap, our research deepened the specificity of the Tanzanian market by looking at the restaurant sector. Restaurants, and other facilities belonging to the catering sector, have a crucial place in the food value chain. They are bridges between urban customers and rural producers. At the same time, they are places of culinary innovation; a creative environment that also contributes to the rediscovery of neglected food and recipes. Considering that, we looked at these places and at the role played by traditional foods in the business.

The chapter opens by presenting the details of the research we conducted in the Iringa and Arusha areas. It discusses the findings of a survey aimed at understanding the main features and dynamics of the restaurant sector, regarding the offers and demands of local and traditional food products and dishes. In so doing, we present the most representative traditional culinary ingredients and dishes used in the catering sector, the place and means

of supply, as well as the main trends connected to what restaurants offer. The analysis of the data describes the promising reality of the traditional food market and points out possible lines of intervention to support the sector.

Before beginning the chapter, we want to thank Vienegani Kuoko and John Msuya for their support during fieldwork and their contribution to the research.

THE RESEARCH

This study is part of the research project "Sustainable Agri-Food System Strategies", undertaken by the University of Gastronomic Sciences, and funded by the Italian Ministry of University and Research in order to explore the opportunities and challenges of better integrating local, neglected and under-utilised species (NUS), also known as orphan crops, in the Eastern African food systems. Full details of the project are provided in previous chapters of the book.

We conducted fieldwork in Tanzania between 2018 and 2020. We carried out a pilot study in the summer of 2018, focusing on the Arusha area, and completed the study in 2020 by carrying out the survey in Iringa, with the collaboration of the Sokoine University of Agriculture, and in Arusha, in collaboration with Slow Food Tanzania.

The selection of the cities was based on the geographic and socioeconomic specificities of the two areas. On the one hand, Iringa is the 18th largest city of the country by population, and one of the main centres of the so-called "Southern Agricultural Growth Corridor of Tanzania", a crucial initiative of rural development initiated at the World Economic Forum (WEF) Africa (WEFA) Summit in Dar es Salaam in 2010. The other city chosen, Arusha, the third-largest city in the country, is an important international centre due to the presence of important international institutions, such as the UN international criminal tribunal, and its proximity to key touristic attractions, such as Serengeti National Park and the Kilimanjaro National Park. Considering these factors, the two locations appeared complementary and able to shed light on the broader dynamics of the food markets and the restaurant sector in the country.

The research was a qualitative study that involved carrying out a campaign of interviews with managers, workers and owners of a selected sample of restaurants in the two key locations. It involved four distinct and subsequential phases: 1) The analysis of the articulation and the main characteristics of the restaurant sector through the combination of ethnographic observation and desk research; 2) The definition of the principal typological clusters of restaurants on the basis of their business structure and their clientele; 3) The selection of the informants for completing the survey in order to investigate all the clusters; 4) The completion of the interviews.

Based on the literature, we were able to cluster the different typologies of restaurants into three main categories of enterprise. Tab 1 summarizes the number of outlets for each category that participated in our survey.

Category	Description	Location	
		Iringa	Arusha
Category 1	Restaurants that serve mostly local, low income, customers	10	14
Category 2	Restaurants that serve mostly local, middle income customers	10	5
Category 3	Restaurants that serve mostly local high income customers, tourists and international customers	13	11

Tab. 1 Classification of the sample according to the three categories

Restaurants participating in the research were selected to be indicative of the regional catering sector articulation according to the type of menu offered, the location of the restaurant, and the potential target customers. For the research, we selected 63 restaurants (33 in Iringa and 30 in Arusha) (see Tab. 1).

The survey was conducted in Kiswahili and the data translated into English. During the interviews, a structured questionnaire of 24 open-ended and closed questions was administered, that investigated the main characteristics of the outlets (e.g., type of cuisine, customers' profile, etc.), the presence of traditional foods among the ingredients used and dishes offered by the restaurants, and the ways in which each restaurant supplied these products. In particular, we asked the informants to list the most important traditional dishes offered on the menu, to mention the place and means of supply of food ingredients as well as the main aspects that drive the choice of purchasing for such products. All the data were then coded and analysed with the qualitative data analysis software, NVivo.

RESULTS

In Iringa, the survey shows that 91 traditional dishes are served in the restaurants. Overall, the largest variety of traditional ingredients is in dishes whose main items are a starch, such as *ugali* (cornmeal), boiled roots and fruits (e.g., taro, sweet potatoes, cassava, plantain, potatoes) and rice, combined with animal-based products (mostly dry or smoked fish, chicken and beef stews) and/or vegetables. The diversity of ingredients and dishes is linked mostly with the economic possibilities of the restaurants and their clientele. The greater diversity is found in restaurants belonging to Cat. 2, which combine better-off, local customers as well as more sophisticated kitchen equipment that allows more elaborate and diverse preparation techniques. Moreover, while in Cat. 1 restaurants the menu offers mostly plant-based dishes or dishes made with less expensive animal products (e.g., offal, dry fish), the restaurants for international or wealthy national clientele (Cat. 2, and Cat.3) include a wider diversity of meat ingredients, such as beef and fresh fish. Focusing on the

vegetable ingredients, the survey found 23 different products used in the outlets. Among them, all the informants define 9 products as *kienieji* (i.e., linked to the traditional food and alimentary traditions) (Tab. 2). The datum highlights how the foodscape of Iringa restaurants is mainly marked by foreign species: species not originating from Eastern Africa, although nowadays cultivated in the area. Examples of such species are spinach, collard greens and cabbage. Among the most spread *kienieji* products are amaranth leaves and African kale. Moreover, in restaurants belonging to Cat. 1 and Cat. 2 sweet potato leaves, cassava leaves and mlenda (different wild species whose leaves acquire a mucilaginous texture when boiled) are also commonly used.

The research conducted in the Arusha area evidences 65 traditional dishes. Overall, a greater diversity of dishes is observed in facilities aimed at a local clientele belonging to the middle and upper class (i.e., Cat. 2). Restaurants in Arusha offer more dishes whose main ingredient is meat than in Iringa. On the other hand, a smaller diversity of vegetables was observed, as well as a partial difference in the type of starchy ingredients, in Arusha. In fact, the use of plantain rather than roots and tubers such as cassava, is prevalent. Plantain is used in the preparation of dishes that characterize the regional culinary tradition such as *mtori* (a stew of plantain, meat and vegetables) and *ndizi nyama* (boiled or roasted plantain accompanied by beef meat or offal).

English name (Swahili name)	**Scientific name**	**Iringa**	**Arusha**
African eggplant	*Solanum aethiopicum* L.	••	-
African kale *(Figiri)*	*Brassica carinata* A.Braun	•••	•
Amaranths	*Amaranthus* sp.	••••	••••
Cassava leaves *(Kisamvu)*	*Manihot esculenta* Crantz	••	-
Mlenda	-	•	-
African nighshade *(Mnavu)*	*Solanum nigrum* L.	••	•••
Okra	*Abelmoschus esculentus* (L.) Moench	•	-
Pumpkin leaves	*Cucurbita sp.*	••	-
Sweet potato leaves *(Matembele)*	*Ipomoea batatas* (L.) Lam.	••	-

Tab. 2 Most purchased traditional vegetables ingredients in the surveyed restaurant

Restaurants in Iringa base their supply chain for the fresh produce mostly on the local markets where they buy their ingredients daily. This solution is motivated by the need to access the freshest ingredients possible and to cope with logistical and technical barriers, such as the lack of adequate preservation systems for the most perishable products (e.g., leafy vegetables and meat). These circumstances are even more important for restaurants that target local clientele such as the so-called *Mama Lishe* restaurants (i.e., small businesses aimed at local dwellers, usually run by women).

Similar to our findings in Iringa, also restaurants in Arusha, especially those that cater to a local clientele, mainly procure their ingredients daily from the local markets. This choice is driven principally by the need to cope with the logistical and technical barriers as in the case of Iringa. Larger restaurants, in particular those in Cat. 3, combine the markets with the use of alternative supply channels, such as direct purchases from local producers and self-production in their gardens or farms. These practices, however, are mostly limited to supply those ingredients that are difficult to find in the market and to guarantee clients with healthy and safe foods.

The attention to the freshness of ingredients is justified not only because of the improved flavour but also, importantly, to a growing health consciousness that has spread among consumers who are asking for fresh and, particularly in the case of restaurants in Cat. 2 and 3, organic products. This demand underlines a firm conviction that traditional ingredients and dishes (mostly plant-based recipes) are healthy and safe.

DISCUSSION AND CONCLUSIONS

The research highlights the crucial role played by *kienieji* ingredients and dishes in the restaurant sector of Iringa and Arusha: a piece of evidence that shows the consistency of the current revival of traditional and local gastronomy in Tanzania. Unlike in Europe and North America, where the revival of traditional cuisine has been mostly driven by cultural and economic elites, the research shows how, for some elements, this phenomenon involves all of Tanzanian society. Specifically, there is, firstly, a gastronomic preference for traditional ingredients and dishes, but also a growing health consciousness that identifies them as a safer and more beneficial option for the diet. This trend is similar to what has been found in other areas of Eastern Africa (Zocchi & Fontefrancesco, 2020). It refutes the interpretation of a revival of traditional products as mostly driven by a cultural response to globalization, and urges us to consider other aspects of living conditions, such as the very specificities in terms of food safety of the local environment.

The research, moreover, points out differences between the products and dishes used in the two cities. This is particularly clear in the diversity of vegetable ingredients, limited in Arusha and strong in Iringa. The datum points out a relevant aspect of regionalism in the Tanzanian cuisine, that stems from a combination of the cultural milieu and the local ecological conditions, which shape the basket of ingredients produced in the two areas. This regionalism appears as an interesting resource for the development of the restaurant and touristic sector, whose promotion is still limited at the current time, and could be a promising resource in the future, where both public institutions and economic actors can adapt to changing touristic demands.

The research, in fact, highlights the increasing demand for traditional products from national and international tourists visiting the areas. This is particularly evident when we look at those restaurants that target international customers (both Africans and Europeans). The increasing curiosity about indigenous food appears as a consolidated trend, that is opening promising niches for those local products that are able to communicate best the specificities of the region and the history of its people.

In the face of these opportunities, the research also points out some limitations, first of all, regarding the logistical and technical barriers that the restaurateurs have to cope with. The difficulty of implementing an adequate preservation system obliges the restaurateurs to purchase products daily from the markets and exposes the enterprises to the impact of high price fluctuations. Overall, these constraints heavily affect those restaurants that mostly serve local, low income, customers.

In this respect, the need emerges to support technological developments in the sector, as well as policies aimed at better integrating the operations of the actors of the food value chain in order to create more stable commercial relationships, as well as foresee alternatives to conventional market channels.

Overall, despite these difficulties, the research shows a promising future for local, traditional foods. Driven by both national and international demand, they are expanding and making their position in the market stronger. This is creating opportunities for both producers and restaurateurs who will invest in these productions. Still, there is a need for public and private support to sustain growth by operating on a market structural level (e.g., improving the market infrastructure as well as limiting the exposure of restaurateurs to market price fluctuations) as well as on the marketing side (e.g., implementing new campaigns aimed at promoting the nutritional and culinary potential of traditional food ingredients, as well as explaining their history and values). In this respect, this volume offers a tool to understand and communicate the products that mark the Tanzanian foodscape and the rich biocultural heritage that underpins it.

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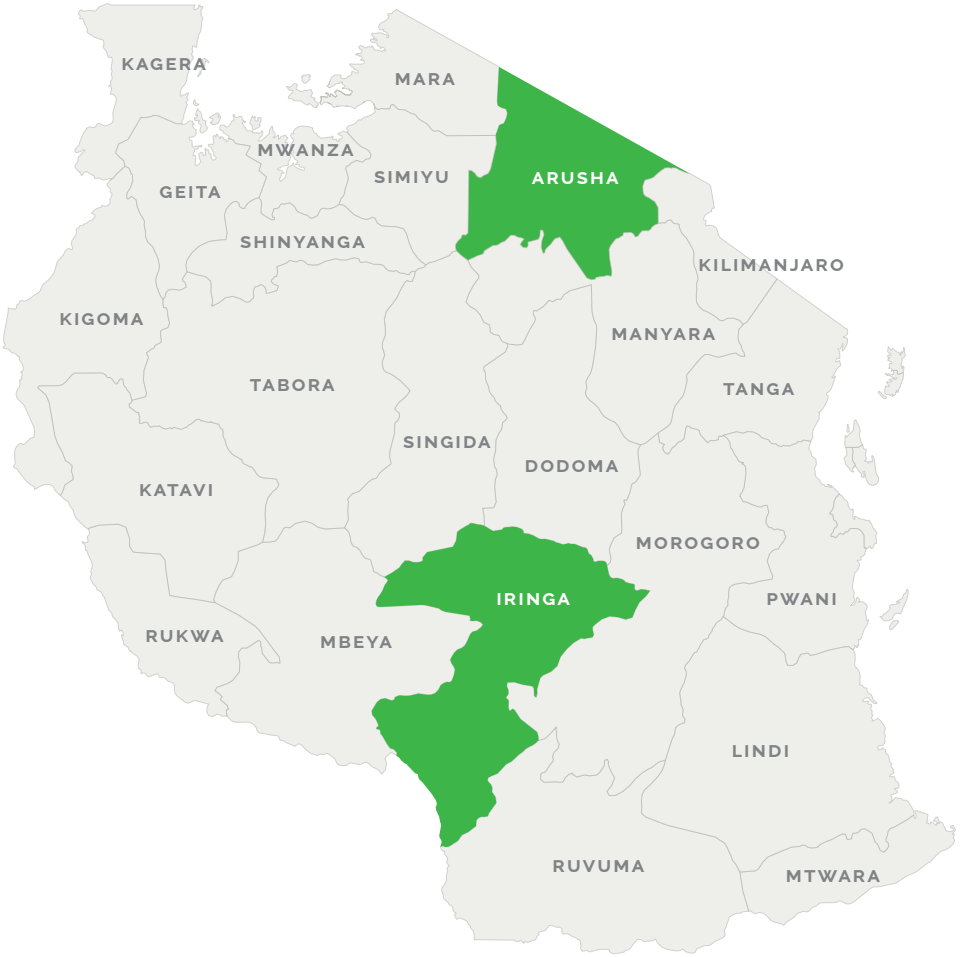

Map of the United Republic of Tanzania and its regions

In green the regions of Arusha and Iringa on which the SASS project mostly focused.

CHAPTER 1

MEAT, FISH, INSECTS AND HONEY

N. 1 ARUSHA STINGLESS BEE HONEY

CATEGORY

HONEY

Slow Food Presidium®

PRODUCTION AREA

Ngurdoto village,
Arumeru District,
Arusha Region

BEE KEEPING TECHNIQUES

Traditional hives are made from hollow tree-trunk sections and hung from the rooves of houses, fences or the highest branches of fruit trees, like mango, avocado and papaya. Normally, beekeepers buy hives already inhabited by swarms from local young people. Young people normally learn from their families how to build hives and manage the swarms. They go into the forest around the village and identify the stingless bee species that need to go into the hive. To harvest honey, each hive is cut in half with a knife, the honey is extracted manually and separated from the wax and impurities using a manual press and gauze filters. Each hive can yield 3 to 4 litres of pure honey per year.

Two of Tanzania's most important active volcanoes are found near Arusha, an urban centre in the north of the country: Mount Kilimanjaro and, 70 kilometres away, Mount Meru. The village of Ngurdoto lies at the foot of Meru's lowest slopes, and it is here that the women of the community produce *nyori*, honey made by the black stingless bees that belong to the *Meliponini* tribe.

Northern Tanzania, and specifically the Arusha region, is well known for its wide variety of stingless bees. According to local beekeepers, there are at least 8 different species that produce honey, of which the large black bees are the most productive. Traditionally, beekeeping was carried out in the forest, far away from the household. The rich diversity of indigenous bee forage species favoured the production of honey. Among the most important species of trees are *Cordia africana, Olea capensis, Albizia* spp., *Combretum* spp., *Croton* spp., *Acacia* spp., and *Grevillea robusta*. Nowadays beekeeping is also practised in home gardens around the household. Bees kept in home gardens generally feed on crops and fruit tree nectar.

Honey is harvested in January, February and, sometimes, in October too, if the season is hot and dry. The honey from mixed flowers has a liquid consistency and a sweet-tart flavour, with citrusy and floral notes.

PRODUCT HISTORY

In the past, beekeeping was regarded as a male activity and was mostly carried out by old men. Men used to spend several days far away from the home in search of wild honey while women stayed at home to take care of the children and grow crops in the home gardens. The long-distances and time spent away from home, as well as the traditional beekeeping methods, limited women's participation in beekeeping activities.

Since the establishment of agroforestry systems, beehives have also been placed nearer to the homesteads, allowing women and young people to get involved in beekeeping activities. Moreover, thanks to the implementation of development projects, beekeeping has become a potential source of income for rural households. In addition to the honey, the producers also extract the propolis from the internal walls of the hive. Propolis is mixed with lemon juice and used to treat toothache, or mixed with sunflower oil to prepare an emollient cream called *supo*. It can also be used as a natural glue.

Nyori is renowned for its medicinal properties, particularly for curing respiratory problems and relieving menstrual pain. It is added to milk or tea or used to sweeten maize or millet porridge.

CURRENT STATUS

Until 60 years ago, nyori was collected in large amounts from wild hives in dry tree trunks, holes in the ground, bushes and trees. However, increased deforestation and pollution have drastically reduced honey production. Moreover, the use of agricultural chemicals, especially herbicides in horticultural production, harm beekeeping, causing bees to abscond from their hives and even die.

Despite efforts to promote beekeeping as a source of income, honey production and trading are still low. Very few shops and markets offer honey and other beekeeping products in the local villages.

THE SLOW FOOD PRESIDIUM

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N. 2 FULU
(LAKE VICTORIA HAPLOCHROMINE CICHLID FISHES)

Haplochromini Poll

CATEGORY

FISH AND SEAFOOD

PRODUCTION AREA

LAKE VICTORIA, NORTH TANZANIA

FISHING SEASONALITY

JULY – JANUARY

FISHING METHODS

TRADITIONALLY, THE FISH WERE CAUGHT WITH FISHING LINES, HOOKS, TRAPS AND SPECIALLY DESIGNED BASKETS. TODAY NETS ARE MORE COMMON. FISHING WAS CARRIED OUT VERY EARLY IN THE MORNING AND IN THE EVENING USING BOATS AND EVEN ALONG THE SHORES. FISHING WAS A DAILY ACTIVITY AMONG THE LUO COMMUNITY WHEN NOT CONTROLLED BY FISHERY DEPARTMENT OR CLAN ELDERS WHO PLACED RESTRICTIONS ON THE ACTIVITY. THE FISHING COMMUNITY HAD TRADITIONAL AND TERRITORIAL RULES AND REGULATION, WHICH ENSURED THAT FISHING WAS CONDUCTED IN A SUSTAINABLE MANNER.

PARTS USED AND PROCESSING

PRODUCTS DERIVED FROM THE ANIMAL	WAYS OF COOKING	WAYS OF PRESERVING
WHOLE FISH	BOILED, FRIED, ROASTED	DRYING, SMOKING

Haplochromine cichlids are small, often brightly coloured, and well adapted to a wide range of habitats and ecological niches. They differ in the size and shape of their bodies, head morphology, and male breeding coloration, trophic specialization and breeding behaviour. The various haplochromine species are collectively referred to as *fulu* in the Luo language; *furu* in Swahili; and *nkejje* in Luganda.

Lake Victoria, the largest lake in Africa by surface area, is home to an astonishing diversity of fish: in the middle of the 20th century, there were over 500 species in the lake, many of them endemic. The majority of these species belong to the tribe Haplochromini in the cichlid family. Until the late 20th century, they constituted 80% of the total fish biomass in Lake Victoria and played a key role in nutrient cycles.

CULINARY USES

Once caught, and in order to improve their shelf life and flavour, the fish are sun dried and then smoked. They may be dried on the ground or on wooden skewers. The latter method makes it easier to smoke or roast the fish, or carry them to market. Because they are so small, haplochromines are eaten whole, often in a soup served with *ugali* (cornmeal), or cooked over charcoal. Among the Luo people, fulu was traditionally prepared by boiling with salt and milk. The meal was served with ugali made from sorghum, millet or cassava.

Today they are rarely caught for food: instead, they are used as bait for Nile perch.

PRODUCT HISTORY

Luo are a Nilotic ethnic group living in western Kenya and in northern Tanzania, especially along the shores of Lake Victoria.

Traditionally, fishing was the main source of livelihood and fish a common meal among the Luo community. Fulu was also highly important to the community from a cultural viewpoint. It was consumed during ceremonies and key events, particularly during childbirth celebrations. Each lady visiting the lactating mother was supposed to bring fulu fish for both mother and the child. It played a key role in bring people together. It was also eaten during other cultural events (Luo night festival which is the celebration of Luo culture).

Among the Luo fishermen, there were rules governing the use of nets, hooks, baits and canoes, which further ensured the sustainable use of the lake's fish resources. There was adherence to a closed season, which was easily adhered to as it coincided with the period of farm work. Clan elders controlled access to the lake and during the closed season canoes were forbidden to go beyond a certain distance on the lake. There was also an element of cooperation in the setting up of the boats.

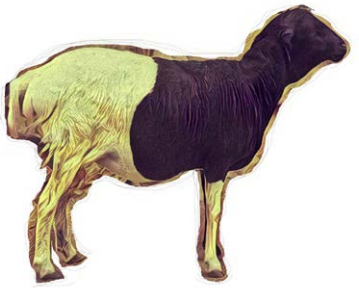
CURRENT STATUS

Lake Victoria is severely ecologically degraded due to industrial pollution. Haplochromines have suffered a tragic mass decline due to overfishing, the introduction of predators such as Nile perch in the lake, decrease in water transparency and eutrophication. These are main reasons to why the species is at the risk of extinction.

Establishing sustainable fishing practices and restoring the quality of the ecosystem is crucial, not only for preserving haplochromine diversity, but for the 30 million people who live in the Lake Victoria basin who rely on its resources for food and income generation.

N. 3 GOGO SHEEP
(UGOGO SHEEP)

Ovis aries L.



CATEGORY

BREEDS AND ANIMAL HUSBANDRY

PRODUCTION AREA

DODOMA REGION

HUSBANDRY METHODS

A FREE-RANGE EXTENSIVE SYSTEM HAS BEEN PRACTISED FOR CENTURIES, AND THIS PRACTICE IS STILL COMMON AMONG GOGO HERDERS OF CENTRAL TANZANIA. PASTURE IS THE MAIN SOURCE OF FOOD AND ANIMALS GRAZE BOTH ON COMMUNAL AND FAMILY LANDS. THE GRAZING HOURS VARY ACCORDING TO THE PREFERENCES OF THE FARMERS, THE LOCATION OF THE PASTURE, AS WELL AS THE TIME OF THE YEAR. DURING DROUGHT, THE ANIMAL FEED IS SUPPLEMENTED WITH GRAINS AND OTHER FODDERS.

WHEN ANIMALS DO NOT GRAZE ON PASTURE, THEY ARE KEPT IN FENCES BUILT WITH TREES OR SHRUBS AND LOCALLY KNOWN AS *KRAAL*. THE FENCES ARE NORMALLY ADJACENT TO THE SAME HOUSE WHERE THE SHEPHERDS LIVE. DURING THE NIGHT, SHEPHERDS CLOSE THE FENCES TO AVOID ANIMAL THEFTS AND ATTACKS FROM WILD ANIMALS.

PARTS USED AND PROCESSING

PRODUCTS DERIVED FROM THE ANIMAL

MEAT, MILK, FAT/LARD

WAYS OF COOKING

BOILED, FRIED, STEWED

The Gogo sheep is a fat-tailed sheep, well adapted to arid and semiarid ecosystems. It is an aseasonal breed meaning it can potentially reproduce all year round. Even under unfavourable conditions, they are more productive compared to other breeds. In fact, they have a slower growth rate and are smaller than other sheep, especially the exotic ones. For these reasons, they can better stand long periods of drought without losing their reproductive capacity. Gogo sheep have two main lambing periods in June - July and December - January. Usually, a ewe has her first lamb at the age of 1 - 2 years.

CULINARY USES

Traditionally, the Gogo sheep was a multipurpose animal that provided meat, fat and milk. Though the majority of the milk the Gogo people drunk was cow and goats' milk, sheep's milk has also been an important food, especially during prolonged droughts.

Sheep meat was normally boiled, fried or stewed and served with traditional staple foods such as millet *ugali*. Nevertheless, people used to eat meat only on special occasions when a sheep was slaughtered.

Fat had several culinary uses and Gogo used it also for the preparation of traditional ointments. For instance, when an infant had diarrhoea the mother gave the baby an oil obtained from the liquefied fat from the tail of the sheep, mixed with extracts of medicinal plants. Nowadays, mothers use fat as a natural restorative, adding it to the millet flour porridge for their babies.

PRODUCT HISTORY

Gogo people have based their livelihoods on livestock keeping and trading and have been able to develop adaptation strategies to cope with the multiple adversities they face in the semiarid conditions of the area. In this environment, livestock provides a source of milk and meat, a way to express the social status of a man, as well as an exchange good in case of crop failure or other urgent needs.

Gogo sheep have been an important element in several traditional ceremonies such as a child's naming ceremony. In this case, the father gave a sheep to the mother as a source of meat. Gogo sheep have also played a part in ceremonies to stop droughts. In these occasions, the Gogo used to gather together on a mountain and sacrifice a black sheep and a black cow, after singing traditional ritual songs together.

In the past, the livestock owners sold part of their flock only when a special need emerged, usually small stock such as sheep and goats. Nowadays the trade of animals is more frequent since people need to cover more family expenses such as school fees.

CURRENT STATUS

Gogo sheep population has steadily decreased due introduction of exotic breeds such as Blackhead Persian. This change also entails a gradual shift from extensive to intensive pastoral systems. The government has promoted this shift as a way to control problems such as land degradation, soil erosion, as well as to maximize the profitability of sheep farming. Abandoning indigenous breeds and losing the traditional knowledge attached to pastoral activities could have negative impacts on the resilience capacity of pastoral communities of the arid areas of Tanzania.

N. 4 KUKU CHIKWALE
(CHIKWALE CHICKEN)

Gallus gallus domesticus L.

CATEGORY

BREEDS AND ANIMAL HUSBANDRY

PRODUCTION AREA

MOROGORO-CHAKWALE VILLAGE, MOROGORO REGION

HUSBANDRY METHODS

KUKU CHIKWALE CHICKENS ARE REARED AT THE HOUSEHOLD LEVEL IN SMALL NUMBERS. EACH FAMILY HAS ITS OWN CHICKENS THAT GRAZE FREE AROUND THE HOUSE AND HOME GARDEN. CHICKENS FEED MAINLY ON GRASS AND HERBS. SOMETIMES LEFTOVER FROM THE KITCHEN AND GRAINS ARE GIVEN TO THE ANIMALS.

PARTS USED AND PROCESSING

PRODUCTS DERIVED FROM THE ANIMAL	WAYS OF COOKING
MEAT, EGGS	MEAT (BOILED, STEWED) EGGS (BOILED, FRIED, DESSERTS)

Kuku chikwale is a Tanzanian heirloom chicken breed, which is found mostly in the upland areas.

The female is short and males are fat with short legs, small eyes and numerous feathers. Their plumage has a range of different colours, from black to white on the whole body.

It is a species with high resistance to disease. This chicken can naturally cure itself by feeding on grasses and herbs, especially during the dry season, which is known as the disease period for chicken. Besides being resistant to diseases, hens can protect their

chicks from the attack of predators. The many feathers on its body play a great role from protection against bites. Kuku chikwale takes care of its chicks for the longest time, as compared to other free-range system birds.

CULINARY USES

Kuku chikwale has strong bones and tough meat, which requires an extended cooking period to soften. Although the meat is primarily tough, once cooked, it is very delicious with a very low-fat content. Its meat is used as an ingredient in stews and soups that are served with starchy foods. The eggs are small and heavy with a hard, white eggshell, small yellow yolk and when boiled, they have a consistency similar to that of a cake.

PRODUCT HISTORY

Besides its importance as food, breeding and consumption of kuku chikwale are tied to the traditional healing practices and heritage of rural communities, especially among the Waluguru people. Traditional healers sometimes follow the kuku chikwale while it goes to feed, in order to see which kind of herbs and wild grasses it eats. Traditional healers tend to use the meat and eggs of the kuku chikwale for their local medicine because they believe that these products have medicinal purposes.

Indigenous chicken rearing is one of the widely practised economic activities in Tanzania and plays an important role in improving household income and nutrition, especially in rural areas. Women and children are in charge of the management of chickens, which are often essential elements of female-headed households.

Local chicken breeding is a potential resource to improve the livelihoods of rural people since it requires low investments compared to the breeding of improved chickens breeds, the meat is more competitive than alternative protein sources, and the market for indigenous chickens is still unsaturated.

Kuku chikwale are sold both in the local markets of Chakwale and urban areas near the village. According to local breeders and sellers, the demand for indigenous chickens is higher between October and December, especially during Christmas time.

CURRENT STATUS

Despite its potential, it is difficult to find kuku chikwale. In Morogoro-Chakwale village, they are reared mostly in the elderly peoples' homes in remote areas in the countryside and by traditional healers who keep them purposely for medicinal use.

Many breeders are not interested anymore in keeping indigenous chicken because they are less competitive from a commercial perspective. This is because they are smaller and produce less meat than improved and exotic breeds. Moreover, many customers do not like the hard texture of the meat and they prefer big broilers with tender meat, that are available at low prices in the market.

NOMINATOR: JANE MARTINE MLANGWA

N. 5 SENENE

Ruspolia differens Serville

CATEGORY

INSECTS

PRODUCTION AREA

KAGERA REGION

SEASONALITY

APRIL - JUNE
NOVEMBER - DECEMBER

GATHERING METHODS

GATHERING OF *SENENE* TAKES PLACE DURING THE NIGHT OR IN THE EARLY MORNING BEFORE SUNRISE, SINCE IN THESE MOMENTS INSECTS ARE LESS ACTIVE AND EASIER TO CATCH. LOCAL PEOPLE USE TWO DIFFERENT METHODS DEPENDING ON THE NUMBER OF INSECTS THEY AIM TO COLLECT. WHEN HARVESTING IS FOR FAMILY CONSUMPTION, THIS OPERATION IS DONE MANUALLY IN THE CULTIVATED FIELDS. WOMEN AND CHILDREN NORMALLY CARRY OUT THIS TASK. WHEN HARVESTING IS DONE FOR COMMERCIAL PURPOSES, MEN CATCH INSECTS USING IRON TRAPS FOLDED INTO A CONE SHAPE LEADING TO A LARGE BUCKET, WHICH COLLECTS THE FALLING INSECTS. THEY PLACE THE TRAP UNDER A BRIGHT LIGHT AND SET SMOKE UNDER IT (LIGHT ATTRACTS INSECTS AND SMOKE INHIBITS THEIR ABILITY TO FLY).

PARTS USED AND PROCESSING

PRODUCTS DERIVED FROM THE ANIMAL	WAYS OF COOKING	WAYS OF PRESERVING
INSECTS	BOILED, FRIED, TOASTED	DRYING, SMOKING

The East African longhorn grasshopper or *senene*, as it is known in Kiswahili, is a cone-headed species belonging to the family *Tettigoniidae* and order Orthoptera.

In Tanzania, senene is a traditional food for Haya people living in Kagera region, though its consumption is also common in all the northern part of the country. Haya people identify different types of senene, naming them accordingly to their appearance and behaviour. Among the most important are *mwanamwana* (which means 'beautiful woman') considered the tastier, *kishorowanda* a green one with purple stripes; *mfaume* that is reported to be the more aggressive one; *katikomile* a brown insect found mostly during the end of the season and *kimbisimbisi* a green insect and the most common in the area.

CULINARY USES

Senene may be boiled, fried and toasted but not eaten raw since it is considered a taboo to do so. For the preparation of senene, inedible body parts (i.e. wings and appendages) are removed by scratching the insects with wood ash. Later on, senene are boiled in water or a spiced broth. At this point, insects are eaten or may be used as an ingredient for other preparations such as smoking, toasting, deep-frying, sun-drying. Processed senene can be stored for up to 12 months. For smoking, senene are rolled in fresh banana leaves (*ekyangwe*) then placed on the kitchen roof locally called *obutala*. The firewood used for senene smoking is from trees with slight or no smell.

Senene is a delicacy normally reserved for men and in-laws. A reception with a plate of these insects is a symbol of respect and acceptance to that family.

PRODUCT HISTORY

Haya customarily consider senene along with other edible insects an important source of food, especially during famine times, and believe they have healing properties. Several studies demonstrate the nutritional values of this insect, highlighting the elevated content of protein (around 44% of the dry weight), amino acids, vitamins, and minerals.

In addition, senene is embedded in the traditional culture of Haya people and is at the centre of several food taboos. For instance, pregnant women cannot eat this insect or it is believed they would give birth to children with a head resembling that of senene.

While in the past Haya was the only ethnic tribe to eat senene, nowadays many communities have adopted this practice, opening the development of a trade for this product. Usually, men carry out the trading activities while women are in charge of the cleaning and processing of insects.

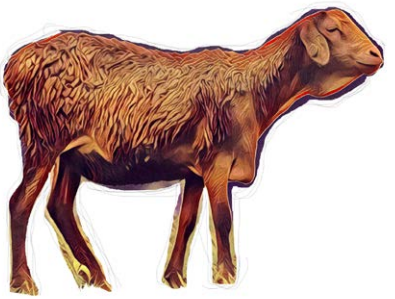
Senene are either sold fresh or processed. Processed senene are more expensive and less commonly found in marketplaces.

CURRENT STATUS

Despite its role in food security and its potential for improving the livelihoods of rural farmers, the presence of senene has decreased over time. According to local people climate change, the use of chemicals in the crop fields and overharvesting threaten the future of this local food source.

N. 6 TANGANYIKA SHEEP
(RED MAASAI SHEEP)

Ovis aries L.



CATEGORY

BREEDS AND ANIMAL HUSBANDRY

PRODUCTION AREA

NORTHERN TANZANIA
KENYA

BREEDING METHODS

TRADITIONALLY, SHEEP FLOCKS GRAZED ON COMMUNAL LAND AND WERE MOVED ACCORDING TO THE AVAILABILITY OF PASTURE. MEN WERE IN CHARGE OF ANIMAL HUSBANDRY. HOWEVER, WITH THE INCREASING PRIVATISATION AND FENCING OF LAND, MANY SHEPHERDS WERE FORCED TO KEEP THEIR ANIMALS IN FENCED-OFF AREAS OR PADDOCKS. NOWADAYS, MANY SHEPHERDS KEEP THEIR ANIMALS IN HOUSING STRUCTURES FENCED WITH WOOD AND CHAINS TO DETER PREDATORS AND TO AVOID ANIMALS DAMAGING THE CROP FIELDS. BOTH CONTROLLED AND UNCONTROLLED BREEDING ARE PRACTISED. CONTROLLED BREEDING AVOIDS LAMBING DURING THE DRY SEASONS. MATING TAKES PLACE IN JUNE AND JULY. THE MAASAI PEOPLE AIM TO MINIMIZE THE DISTANCE BETWEEN THE *BOMA* (WATER POINT) AND GRAZING LOCATIONS FOR THE SAKE OF BOTH ANIMALS AND HERDERS.

PARTS USED AND PROCESSING

PRODUCTS DERIVED FROM THE ANIMAL

MEAT, FAT/LARD

WAYS OF COOKING

BOILED, FRIED, ROASTED

The Tanganyika sheep or Red Maasai sheep is an East African fat-tailed sheep, so-called because the Maasai people of East Africa traditionally raised them. However, this indigenous breed was also kept by other pastoral communities living in southern Kenya, northern Tanzania and parts of Uganda. This breed, which is noted for having hair instead of wool, is used primarily for meat. It has a red, brown or black coat, but sheep are also occasionally seen with pied coats. They have a relatively heavy body, are short, fat-tailed, with an accumulation of fat on the neck and the back. Males weigh 45 kilograms on average while females weight 35kg at maturity. Notably, they are also resistant drought and to local diseases and parasites such as the *Haemonchus contortus* parasite.

CULINARY USES

The Maasai normally eat mature sheep that are 12 months old or older. Sheep slaughtering is common mainly during wedding and initiation ceremonies. Meals prepared at the homestead are organised by women and can include various types of stews and other dishes made with sheep meat. When a sheep is slaughtered, Maasai prepare two traditional dishes namely *munono* and *urpurda*. The former is a mixture of intestines, meat and blood cooked together in a large plot. Urpurda is fried fatty meat from the belly of the animal. Once the meat is cooked, it is stored in a container covered with fat. This product lasts for a long time without spoiling. The head and the bones of the sheep are used for the preparation of a healing soup along with traditional medicinal herbs.

In the past, fat was given to lactating mothers to increase milk production and it was drunk (sipped like water) as a remedy for stomach-ache and as a natural tonic.

PRODUCT HISTORY

Red Maasai sheep are predominantly kept by the Maasai pastoralists and by the neighbouring tribes. According to legend the red Maasai sheep was the first animal kept by the Maasai. They were involved in the beginning of Maasai life and rearing of animals.

Red Maasai sheep are still significant (though less than in the past) to the Maasai community, especially during ceremonies and bridewealth payments: the bridegroom brings red Maasai sheep to the girl's parents to be allowed to continue with the marriage arrangements. It was the favourite animal to be given to individuals as a gift and to slaughter it when a guest arrived. In addition, red Maasai sheep are valued for their uniform red colour, since traditional Maasai clothes as well as the sand in the area are red. However in Tanzania many people also value the black Maasai sheep.

The sheep used to be kept for home consumption but farmers have started to run businesses with butcheries and market the meat.

CURRENT STATUS

Red Maasai sheep husbandry has declined over time due to crossbreeding with Dorpers; the small stature of this local breed; the low rate of growth; its alleged low productivity, and the lack of the ready market for traditional breeds. While cross-breeding has resulted in the short term development of valuable breeds, many shepherds highlight several problems with the introduced breeds such as a high rate of mortality during drought and higher cost of management. Unpredictable seasonal changes and recurrent droughts may lead to greater demand for well-adapted and sustainable sheep such as the red Maasai, though the availability of pure rams is very low.

In addition, in Kenya and Tanzania, Maasai people have lost land to expanding farming populations, private ranches and expansion of tourist parks, and, for these reasons, have gradually abandoned traditional sheep herding for mixed systems that combine cash crops farming and livestock rearing in paddocks.

NOTES

FRUIT AND VEGETABLE

N. 7 BILIMBI
(CUCUMBER TREE)
Averrhoa bilimbi L.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

MOROGORO REGION

SEASONALITY

HARVEST

SEPTEMBER – APRIL
MAY – AUGUST

SENSORY ANALYSIS

VISUAL

FRUITS ARE ELLIPSOIDAL AND ELONGATED IN SHAPE AND THEY MEASURE ABOUT 4 – 10 CM. ONCE RIPE, THEY TURN FROM BRIGHT GREEN TO YELLOWISH-GREEN. THE OUTER SKIN IS SHINY, SOFT AND VERY THIN WITH A JUICY BUT EXTREMELY SOUR GREENISH-WHITE FLESH. THE SEEDS ARE BROWN AND FLAT IN SHAPE. THE FRUITS GROW ON THE BARE STEM AND TRUNK.

TASTE AND CONSISTENCY

THE FRUITS ARE VERY CRUNCHY AND HAVE A SOUR FLAVOUR. THE FLESH IS JUICY WITH A JELLY LIKE TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

BEVERAGE, STEWED

WAYS OF PRESERVING

DRYING

Bilimbi is a tropical plant belonging to the family Oxalidaceae, native to Southeast Asia, but currently cultivated in a range of other countries, including Tanzania.

It is an evergreen shrub-like tree that commonly grows between 5-10 metres tall, but can sometimes reach over fifteen metres in height. The leaves are bright green, hairy and pinnate shaped. They form clusters at the end of the branches.

Bilimbi is mainly cultivated in the area of Morogoro, from 1200 metres above sea level and under. The plant needs direct sunlight and warm temperatures, being very sensitive to the cold, especially when very young. This plant is mostly found in home gardens and its growth requires watering and good soil. Local gardens are known for their diversity of plants and crops. In small plots of about 1-3 ha fruit trees such as citruses, mango, and passion fruits

are intercropped with vegetable crops. Besides their richness in agrobiodiversity, home gardens play a crucial role in the food security of rural families.

Bilimbi fruit can be harvested both green and ripe. When harvested ripe they have a short shelf life.

CULINARY USES

Given its strong acidic flavour, bilimbi fruits are not consumed fresh, by themselves. They are usually sun-dried and used as a spice in the preparation of other seasonal dishes.

In Morogoro, the fruit is used to prepare several local dishes like Bilimbi squash and Bilimbi curry. The juice from the pulp is also used to prepare a refreshing drink and a fruit wine that is made by cutting the fruit into pieces, adding water and sugar, and leaving it to ferment.

In the coastal region of Tanzania, where the culinary influence of southeast Asian is stronger, bilimbi fruits are pickled and served as an accompaniment to fish dishes.

PRODUCT HISTORY

As in many rural communities of Tanzania, traditional medicine provides an important source of health care and support for the people living in the remote areas of the Morogoro region. Traditional healers cover already an important role inside the villages, providing an affordable source of knowledge and natural remedies to local dwellers. Despite not being native to the area, bilimbi is used in traditional medicine for the treatment of a variety of ailments. Both the fruit and the leaves are considered beneficial for alleviating health issues such as: coughs, thrush, fever, inflammation, rheumatism, intestinal bleeding and acne.

Fresh and dry fruit is sold mostly in local open-air markets and along the roads. However the majority of the production is aimed at family consumption.

CURRENT STATUS

While in the past the fruit was commonly found in the home gardens of many rural households, at the moment it is difficult to find this plant due to the lack of market demand for the product. Moreover, the Morogoro region has experienced a high rate of deforestation and abandonment of the traditional agroforestry systems. Forestlands have been converted in agricultural plots for crop productions, as well as in plantations of teak (*Tectona grandis*) and eucalyptus (*Eucalyptus globulus*). The changes in the local environment could lead to a loss of the traditional ecological knowledge, hence directly affecting the health conditions of the local population.

N. 8 BUNGO
(WHITE RUBBER VINE)

*Saba comorensis (*Bojer ex A.DC.) Pichon

CATEGORY

FRUIT AND NUTS

OTHER NAMES

MBUNGO

PRODUCTION AREA

ISLANDS OF PEMBA AND ZANZIBAR
MOROGORO REGION

SEASONALITY

HARVEST

END OF THE RAINY SEASON AND BEGINNING OF THE DRY SEASON.

SENSORY ANALYSIS

VISUAL

THE BUNGO RUBBER VINE PRODUCES A LARGE ROUND BERRY BETWEEN 25 MM TO 60 MM IN DIAMETER. IT HAS A THICK GREEN, LEMON-LIKE SKIN, WHICH TURNS YELLOW OR ORANGE WHEN RIPE. THIS FRUIT CONTAINS EDIBLE PULP AND A LOT OF SEEDS, EACH ABOUT 1 CM LONG.

TASTE AND CONSISTENCY

SWEET AND SOUR.
IT IS SAID TO TASTE LIKE A MIXTURE OF A MANGO, AN ORANGE AND/OR A PINEAPPLE.

EDIBLE PARTS AND COOKING TECHNIQUES

PULP, ROOTS

BEVERAGE

WAYS OF PRESERVING

FERMENTING

Bungo is the fruit of a rubber vine that grows in several countries in western and central Africa, especially in Tanzania, Kenya, and Ghana. It can grow up to 20 metres long, its stems looping through the forest or scrambling over trees and shrubs. In Tanzania, bungo is found in riverine forests and rain forests up to 1800 metres above sea level. Bungo grows in a variety of soils including gritty, sandy, clay, loam and dark grey compacted loamy soils. It also grows well on the banks of rivers where it acts to protect the soil from erosion.

Fruits are mostly collected from the wild. However, the vine can be propagated using fresh seeds and cuttings. At times it is planted and used as a living fence, for example on the islands of Pemba and Zanzibar.

Bungo plays an important ecological and alimentary role for local communities. Besides its use as food, the bungo trees provide an important source of nectar for bees, sustaining crop pollination and small-scale beekeeping.

CULINARY USES

Bungo is mostly harvested from the wild for its edible fruits and for its medicinal uses. Ripe fruits are eaten fresh as a snack. The fruits are also used to prepare juice. Normally the seeds are removed from the pulp and the pulp is blended with water and sugar. The juice can be drunk either fresh or left to ferment.

Bungo is also used in the traditional medicine. A decoction of its roots is used to cure snakebites and a decoction from its bark is used for the treatment of rheumatism. The leaves soaked in water are used for the preparation of a drink to treat hypertension.

PRODUCT HISTORY

In the past Pemba Island was an important source of agricultural and timber products. It was dubbed "Green Island" by the Arabs that settled on the island in the XVIII century due its wealth of natural resources. Since then, several changes in the local landscape have occurred as a result of deforestation and the replacement of the forest surface with cash crop productions. While the industrialisation of the agricultural sector contributed to the wealth of the British colonial government, it also seriously compromised the food security of the local population. As such, many famine periods occurred due to drought and adverse conditions. When crop production failed, wild and semi-domestic fruit such as the bungo fruit, wild varieties of pineapple, and the wild banana of Pemba, played an important role in the diet of local dwellers, especially for children.

Among the communities where it grows, bungo is also regarded as an ornamental tree, a source of rubber and good for building. In the past, the gum produced by bungo was traded, even abroad, before it was substituted by the Brazilian rubber tree (*Hevea brasiliensis*), a tree that is more adapted to industrial production and that would dominate world production from the beginning of the 20th century.

Nowadays, bungo is no longer considered a famine food. This plant is not cultivated and mainly grows wild. It is still appreciated for its fruit. Juice made from the pulp is sold in some local shops in Zanzibar, especially in Pemba.

CURRENT STATUS

Despite its potential role in food security, nutrition, and health, the use of this fruit has decreased and bungo has become a neglected tropical indigenous fruit tree in Tanzania and other Eastern African countries.

NOMINATOR: MNAYAH SETH MWAMBAPA

N. 9 DELEGA
(MALABAR SPINACH)

Basella alba L.

CATEGORY

LEAFY VEGETABLES

OTHER NAMES

NDELEMA

PRODUCTION AREA

MOROGORO REGION
KILIMANJARO REGION
(ALSO IN ARUSHA, TANGA, MBEYA, IRINGA, RUVUMA, AND DAR ES SALAAM)

SEASONALITY

SOW

NOVEMBER – MAY
(RAINY SEASON)

HARVEST

3 WEEKS AFTER SOWING AT REGULAR INTERVALS FOR UP TO 6 MONTHS (USUALLY BETWEEN 2-4 MONTHS).

SENSORY ANALYSIS

VISUAL

A PERENNIAL CLIMBING HERB WITH A GREEN OR BROWNISH-PURPLE STEM. THE LEAVES ARE SHINY, GREEN, THICK, AND USUALLY 5-10 CM LONG. THEY ARE SUBCIRCULAR, OVATE, OR HEART-SHAPED AND ARE ARRANGED ALTERNATELY ALONG THE VINE. THE SMALL FLOWERS ARE BORNE ON SPIKES GROWING FROM THE LEAF AXILS AND CAN BE WHITE, PINK, OR RED. THE SMALL FRUITS ARE ROUND AND WHITE, RED, OR BLACK.

TASTE AND CONSISTENCY

THE RAW LEAVES HAVE THE FLAVOR OF CITRUS AND PEPPER. WHEN COOKED, THEY TASTE LIKE REGULAR SPINACH. RAW LEAVES ARE JUICY AND CRISPY, WHILE COOKED ONES HAVE A SLIGHTLY MUCILAGINOUS TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, SHOOTS

RAW, BOILED,
SAUTÉED, STEWED

WAYS OF PRESERVING

DRYING

Delega is a climbing plant, which grows spontaneously in the high rainfall zones in forests, bushland and farmlands, as well as by the road and as a weed. The plant can be also cultivated, provided there is a rich enough soil and available water. It grows best in a cool to moderate climate.

It can be propagated vegetatively or from seed, the former being the most common method. Farmers collect the seeds during the harvesting season, dry them in their coats, and store them for up to 6 months. As a climber, delega is usually intercropped with supporting species such as coffee, or planted next to walls or stands.

Women take care of the harvesting by picking the green leaves manually both from cultivated and wild plants. Once collected, the leaves can be dried and stored for later use, though this practice is not so common for this leafy vegetable. Besides its use for human consumption, leaves and stems of delega are excellent fodder for dairy cattle.

CULINARY USES

Leaves and shoots can be prepared in a similar way to other leafy vegetables. For its preparation, leaves and shoots are washed, drained, and blanched for few minutes. Once ready, they are drained and sautéed with oil, tomatoes and onions. Delega is served with beans, plantain (roasted, fried or boiled) or other starchy foods such as cassava, sweet potato, and *ugali*.

In the Morogoro region, delega is a common side dish, usually cooked with milk. Rural dwellers in Morogoro appreciate this vegetable for its slimy texture once cooked.

Delega is also an ingredient of *kitalolo* that is a traditional dish made from a mixture of leafy vegetables, fermented milk and boiled maize.

PRODUCT HISTORY

Along with other wild and cultivated leafy vegetables, delega has played a crucial role in the livelihoods of rural communities in Morogoro, especially due to its adaptability to harsh climates and its fast growth, as well as for its nutritious and healing properties.

It has been traditionally given to pregnant women and children to enhance their immune systems, as it is an excellent source of iron. It is also a good source of Vitamin A and, for this reason, is used as an ointment for skin and eyes. According to local knowledge, the leaves, stems and roots of this climber are soothing for HIV sufferers because they are soft and easy to swallow and thus suitable for people experiencing mouth and throat sores, as well as relieving distress from constipation. Moreover, rural dwellers in Morogoro have traditionally used delega as a treatment for indigestion.

Even today, people mostly harvest wild and cultivated delega for home consumption. Some farmers and collectors sell small amounts of this product in local marketplaces, especially during the rainy season.

CURRENT STATUS

In the Morogoro region, the consumption of delega has decreased dramatically in recent years. Despite its excellent nutritional properties and medicinal uses, many people have replaced delega with other exotic leafy vegetables such as spinach (*Beta vulgaris*) and kale (*Brassica oleracea*). The limited diffusion of this product is also due to the quick deterioration of the leaves once picked, a crucial factor that hinders its sale.

N. 10 FIWI (LABLAB BEAN)

Lablab purpureus (L.) Sweet

CATEGORY

LEGUMES

OTHER NAMES

NGWARA

PRODUCTION AREA

DODOMA REGION
MOSHI REGION

SEASONALITY

SOW

RAINY SEASON

HARVEST

4 – 6 MONTHS AFTER SOWING

SENSORY ANALYSIS

VISUAL

A CLIMBING HERBACEOUS PERENNIAL PLANT WITH A VIGOROUS TAPROOT. IT IS BUSHY, SEMI-ERECT AND EXHIBITS TYPICAL PROSTRATE GROWTH HABIT. THE LEAVES ARE SHINY, GREEN OR PURPLE, AND UP TO 15 CM LONG. THEY ARE TRIFOLIATE, WITH A VARIABLE SHAPE, AND ARE ARRANGED ALTERNATELY ON THE VINES. PODS ARE BROAD AND UP TO 10 CM LONG. SEEDS ARE BROWN TO BLACK WITH A WHITE HILUM (EYE) AND A LONG ARIL.

TASTE AND CONSISTENCY

SEEDS HAVE A RICH FLAVOUR SIMILAR TO THAT OF MUSHROOMS AND A VELVETY TEXTURE. LEAVES HAVE A MILD TASTE SIMILAR TO THAT OF SPINACH (*SPINACIA OLERACEA*).

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, SEEDS

BOILED, SAUTÉED, STEWED

WAYS OF PRESERVING

DRYING

Hyacinth bean or lablab bean is a prehistoric crop widely grown in the tropics and subtropics and is often considered an indigenous African crop. It is a long-lived annual or short-lived perennial.

In Tanzania, *fiwi*, as it is known in Kiswahili, is grown in arid and semi-arid regions. In northern Tanzania, the most common variety is grown as an annual for seed production and livestock forage.

Smallholder farmers in rural areas traditionally grow this legume as a garden crop. They usually intercrop the species with maize as the latter serves as a support for the

development of the plant. The main sources of seeds are farmers' exchanges and farmers' saved seeds.

Fiwi has many outstanding qualities including its tolerance to heat and drought and its adaptability to deep sands to heavy clays soil due to its excellent botanical features.

CULINARY USES

Both leaves and grains are edible and used as culinary ingredients, especially in the rural districts of Dodoma and Moshi regions. The young leaves can be eaten as a green vegetable either boiled or sautéed. The leaves are occasionally used as a relish, though people consider them less palatable than other leafy vegetables such as cowpea leaves (*Vigna unguiculata*).

Dry or green beans are boiled or stewed after being soaked. The beans can be cooked with vegetables such as onions and tomatoes or along with maize. They may also be boiled and used as a relish with *ugali* or as an ingredient in stews and soups.

PRODUCT HISTORY

Given its long legacy within the African territory and its multiple uses, fiwi has been an important crop in the traditional agricultural systems for a long time, as well as a staple food for many rural communities in Tanzania. Besides the use of leaves and beans for human consumption, this species also provides fodder for livestock, improves soil fertility through fixation of atmospheric nitrogen, and reduces soil erosion.

Nutritionally, fiwi seeds and leaves are high in protein and can help in fighting diseases linked to malnutrition. In comparison to other legumes, the grains and the leaves offer a high level of crude protein, 20 to 28% and 21 to 38% respectively.

While in the past, farmers mostly used to carry out fiwi cultivation for home consumption and the local markets, nowadays most production of this legume in northern Tanzania is for export as a cash crop to meet the growing demand in Kenya, especially from Kikuyu people.

CURRENT STATUS

Fiwi is still underutilized in comparison with other legumes. Its production has dramatically decreased in recent years due to the high level of labour needed for the harvest and increased susceptibility to diseases and pests as a consequence of prolonged droughts. Concurrently, the demand for this product has decreased because it has a very poor image as a food source: the seeds take a long time to cook and they they are not very palatable. On the other hand, the market for the grains depends on the export to Kenya. When the market becomes saturated the price drops significantly affecting the profits of Tanzanian producers.

N. 11 FURU
(BLACK PLUM)
Vitex doniana Sweet

CATEGORY

FRUIT AND NUTS

OTHER NAMES

MFURU

PRODUCTION AREA

UYUI AND SIKONGE DISTRICTS, TABORA REGION

SEASONALITY

HARVEST

APRIL – JULY

SENSORY ANALYSIS

VISUAL

THE FRUITS ARE SMALL OBLONG DRUPES WITH AN AVERAGE DIAMETER OF 3 CM. THEY ARE GREENISH IN COLOUR WITH WHITE DOTS WHEN YOUNG, TURNING DARKER UNTIL THEY BECOME ALMOST BLACK WHEN RIPE. THEY HAVE AN EDIBLE, STARCHY BLACK PULP AND 4 HARD SEEDS, WHICH ARE CONICAL IN SHAPE.

TASTE AND CONSISTENCY

THE RIPE FRUIT IS SWEET IN TASTE, WITH A FLAVOUR SOMEWHAT SIMILAR TO THAT OF A PRUNE, AND MEALY IN CONSISTENCY.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, FRUIT, SEEDS

RAW, BEVERAGE

WAYS OF PRESERVING

FRUIT PRESERVES

Furu is a wild plant belonging to the Verbenaceae family, found mainly in the northern part of Tanzania. It is a tree, growing from 8 to 18 metres tall, with rough, pale brown or greyish white bark. It produces densely borne flowers with white petals, except for the largest lobe, which is purple, between August and November.

Furu is one of the indigenous species of the Miombo woodland ecosystem. The trees grow in wooded grassland and forest edges up to 2000 metres above sea level. Wild animals, especially monkeys, play a crucial role in the dispersion of the seeds.

People harvest the ripe fruits from the wild, and children eat them as a snack. There are two methods to harvest furu: directly from the tree or collected from the ground once they have fallen naturally.

CULINARY USES

The sweet, blackish pulp of the fruits is eaten raw and often used to make jams and juice. While not so common, the seed can be removed by cracking the hard shell of the inner stone and eaten raw. Moreover, among the Nyamwezi people, the young leaves of furu are eaten as a vegetable or in sauces.

A beverage can also be made from the fruit juice, and and the boiled fruit is the basis of alcoholic liquor and wine. In Tabora, an infusion made from the leaves is added to alcoholic brews to make them stronger (i.e. to increase the alcoholic content of the drink).

PRODUCT HISTORY

Nyamwezi are the second largest ethnic group of Tanzania. They are subsistence farmers and pastoralists, living in the western part of the country, in the regions of Tabora and Shinyanga. Wild fruits gathered from the Miombo woodlands represented an important source of micronutrients in the diet of the Nyamwezi people. Furu was among the most frequently consumed wild fruits, especially during and after the long rainy season.

Besides its use as food, furu has been employed in traditional medicine: juice squeezed from the leaves is used to treat eye disease while a decoction of the roots serves to treat gonorrhoea and muscular pain. Furu trees are also a good source of timber for furniture, tools and even traditional beehives.

Furu is harvested mostly for personal consumption and consumed when in season. During the picking season, the fruits can be found in local markets. Women are in charge of the trading of furu and other wild fruits.

CURRENT STATUS

Due to the alteration of rural ecosystems and landscapes, furu trees and fruit may be at risk of extinction. Younger generations also tend to ignore this local fruit, preferring to eat exotic fruits rather than traditional ones. In an attempt to recover the ecosystem and contribute to the improvement of livelihoods in the local communities, reforestation programs with indigenous species such as furu have been promoted by national and international organizations. In particular, in the districts of Uyui and Sikonge, a group of women planted this tree along the edges of their home gardens.

N. 12 KANSWELELE
(UYOGA MDOGO MWEUPE)

Boletus L.

CATEGORY

FUNGI / MUSHROOM

PRODUCTION AREA

TABORA REGION

SEASONALITY

HARVEST

RAINY SEASON

SENSORY ANALYSIS

VISUAL

WILD, WHITE MUSHROOM THAT IS SMALL IN SIZE, NEVER USUALLY GROWING LARGER THAN 5 CM TALL.

TASTE AND CONSISTENCY

SWEET WITH A FLESHY TEXTURE. WHEN DRIED, IT ACQUIRES A SLIGHTLY SMOKY FLAVOUR.

EDIBLE PARTS AND COOKING TECHNIQUES

FUNGI

BOILED, STEWED

WAYS OF PRESERVING

CURING, DRYING, SMOKING

Kanswelele, or uyoga mdogo mweupe as it is also called locally, is the name of a wild mushroom traditionally eaten by rural communities in Tabora region of western central Tanzania.

It grows in the faecal matter of cattle as well as close to cropped fields. People collect this mushroom during the rainy season and they use it fresh in different local dishes. Women and children go out mushroom hunting, especially early in the morning.

It is said to be a very sweet mushroom, and is locally famous and highly sought after for its good taste, but it's relatively rare to find it in the wild. To improve the shelf life of kanswelele, collectors and traders usually sun-dry, smoke or conserve the mushrooms with salt.

CULINARY USES

In Tabora, people eat both fresh and dry mushrooms, mostly in stews and soups. For instance, it can be used to give a deeper flavour to vegetable dishes, such as a stew made with *nsansa* leaves (*Vigna unguiculata*). The stew is served with ugali, plantain or boiled cassava.

Dry mushrooms are processed as follows: Once harvested, the kanswelele mushrooms are dried in the sun for two to five days, depending on weather conditions. The dried mushrooms have a creamy or yellowish colour. People store them in earthenware pots, willow baskets, paper or plastic bags for up to a year with no signs of deterioration. Before they are used, they are first soaked in cold water for at least 20 minutes, and then washed thoroughly.

PRODUCT HISTORY

Harvesting of wild herbs, fruits and mushroom is strongly connected to the livelihoods of many Tanzanian communities, especially the ones living close to the Miombo woodlands. Over 60 edible mushroom species have been identified in Tanzania and most of them are found in the Miombo ecosystem.

Traditional knowledge about mushroom identification, collection and preparation is handed down orally from one generation to another. The most knowledgeable people are the elderly women in Tanzania.

Kanswelele are harvested both for personal or household use and for sale at a local level. In the local open markets, both fresh and dry mushroom are sold. The dry mushrooms are sold at relatively higher prices compared to fresh ones.

CURRENT STATUS

With youth migration in Tanzania towards cities and away from rural areas where skilled elderly people live, the knowledge of how to gather and use this mushroom is increasingly being lost. Because eating mushrooms gathered in the wild is risky and should not be undertaken by individuals lacking knowledge in mushroom identification, the migration of youth affects the process of handing down this information and know-how over generations, putting the use of this mushroom species in Tanzania at risk of being lost.

N. 13 KIMANSHIGHA
(UYOGA MDOGO MWEUPE)

Diplocyclos schliebenii (Harms) C.Jeffrey

CATEGORY

LEAFY VEGETABLES

PRODUCTION AREA

KILIMANJARO REGION

SEASONALITY

HARVEST

AVAILABLE THROUGHOUT THE YEAR

SENSORY ANALYSIS

VISUAL

IT HAS PALMATE LEAVES THAT MEASURE FROM 7-13 CM ACROSS. ITS FRUITS, BORNE SINGLY OR IN SMALL CLUSTERS, ARE OVAL SHAPED, ABOUT 3 CM LONG, AND RED (WHEN MATURE) WITH LONGITUDINAL WHITE STRIPES.

TASTE AND CONSISTENCY

BITTER TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES

SAUTÉED, STEWED

Kimanshiga is the Chagga name for *Diplocyclos schliebenii*, a climbing herbaceous plant in the Cucurbitaceae family. It grows wild in areas of rich soil and shade, such as forests and along rivers, and is also cultivated on farms and in home gardens. Kimanshigha climbs several metres into the surrounding vegetation, attaching itself to trees and shrubs with its tendrils. It grows especially well in Kilimanjaro, Kagera, Arusha, Morogoro, Iringa and Ruvuma regions of Tanzania.

Chagga people grow the plant in their home gardens, locally known as *kihamba*. The Chagga home garden system involves four vegetation layers: trees provide shade for the plants below; bananas, form the basis of the local cuisine; arabica coffee grows beneath the bananas; and below the coffee bushes grow various vegetables and root crops, including

taro and maize. Coffee, bananas, and taller trees provide structural support for kimanshigha and other vines and lianas such as oyster nut (*Telfairia pedata*).

Only the leaves of kimanshigha are used for human consumption. Provided that there is enough moisture, the leaves are available throughout the year.

CULINARY USES

Kimanshigha leaves are a crucial ingredient in the traditional dish *nyanyi kitalolo*, which also includes green bananas or maize, beans (preferably cowpeas), and sour milk. This dish is highly nutritious and easy to swallow, making it suitable for children, the elderly, women who have just given birth, and the ill (including HIV/AIDS sufferers). The leaves can also be sautéed with onions and carrots and served with porridge, rice, or yams.

PRODUCT HISTORY

The Chagga people live in northern Tanzania, around Mount Kilimanjaro, Mount Meru, and in the city of Moshi. The southern and eastern slopes of Kilimanjaro are among the most densely populated rural areas in Tanzania but, for centuries, the Chagga have used a highly sustainable agricultural system that supports both a large population and an incredible diversity of wild and cultivated plants.

Kimanshigha is strongly tied to the Chagga culture. Besides its role in the local gastronomy, it is used in traditional medicine and ethno-veterinary treatment. Kimanshigha is traditionally used to treat stomach pains: adults chew four clean leaves three times a day until the stomach ache subsides, while babies and small children eat leaves that their mothers have chewed up for them. Chagga and Meru people report that cows produce more milk if they eat kimanshigha.

CURRENT STATUS

Kimanshigha is not a popular or well-known food among young people, and the plant is vulnerable throughout its range due to deforestation. Even more worrying is the fact that the Chagga home garden system is becoming less sustainable because of population pressure, low market prices for coffee, the erosion of local traditions (young people are not taking over traditional farming from their parents and grandparents), and climate change.

N. 14 KISHONANGUO
(BEGGAR TICKS)

Bidens pilosa L.

CATEGORY

LEAFY VEGETABLES

OTHER NAMES

MUNYUGUNYUGU

PRODUCTION AREA

ARUMERU DISTRICT, ARUSHA REGION

SEASONALITY

HARVEST

RAINY SEASON

SENSORY ANALYSIS

VISUAL

A WEEDY HERB LESS THAN 1M TALL, WITH A GREEN STEM AND STICKY HEART-SHAPED SEEDS. IT GROWS ERECT, WITH SEVERAL BRANCHES. COMPOUND LEAVES ARE PURPLE-GREEN, GROWING IN GROUPS OF THREE, WITH SCALLOPED EDGES. THE PLANT HAS SMALL YELLOW FLOWERS WITH WHITE OUTER RAYS. FRUITS HAVE BLACK AND YELLOW-TIPPED BRISTLES THAT CAN CATCH ONTO FUR AND CLOTHES TO AID DISPERSAL.

TASTE AND CONSISTENCY

YOUNG LEAVES ARE BITTER WITH A SPICY TASTE AND A RESINOUS FLAVOUR.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, YOUNG SHOOTS

BEVERAGE, SAUTÉED, SEASONING, STEWED

Kishonanguo is a semi-wild ruderal species, found in highlands and tropical areas with high rainfall, usually below 2,100 m above the sea level.

It grows by the road, in grazed areas, in wastelands and as a weed in cultivated plots. In addition to growing spontaneously, it can be propagated through seedlings. Nevertheless, rural dwellers mostly collect this species from the wild, especially during the rainy season. In humid areas of Tanzania, it is available all year round.

Kishonanguo is a multiple purposes species that covers an important ecological role in the traditional food systems in rural areas and provides an important source of food for

rural communities. Tanzanian communities use the leaves and young shoots as an edible vegetable and in traditional medicine. Moreover, the stems and other parts of the plant serve as animal fodder, and the pollen from the flowers is a source of forage for bees.

CULINARY USES

Leaves and young shoots serve as a relish, an ingredient of herbal teas or as a spice. It can be cooked alone or along with other leafy vegetables such as flame flower (*Talinum portulacifolium*) and legumes (e.g. peas and beans), and seasoned with simsim or groundnut paste. These dishes are usually served with stiff porridge, rice, plantain, or boiled and pounded maize. People eat kishonanguo as a substitute for other bitter leafy vegetables such as hair lettuce (*Launaea cornuta*). In the Arumeru District, local communities use the leaves of this species as a substitute for tea leaves. For its preparation, leaves are boiled in the water and the resulting liquid is drunk as a treatment for different diseases.

PRODUCT HISTORY

For rural communities in Arumeru, kishonanguo has historically played a crucial role in the subsistence of local people, especially those belonging to Meru tribe.

In traditional medicine, it is used in a variety of preparations, such as a dry powder, decoction, maceration and tincture. For instance, teas and juices made from the aerial parts of this species serve as a treatment for high blood pressure and anaemia as well as to prevent malaria, alleviate toothache, improve eye health and in the treatment of wounds.

Kishonanguo is among the traditional leafy vegetables with the highest tenure in protein, fat and minerals. Given its high content of essential nutrients, including a high level of vitamin A, vitamin C, iron and protein, *Bidens pilosa* has been considered in many projects a good candidate to address food related diseases.

Local producers and gatherers sell the fresh leaves of this species almost exclusively in local markets or in stalls along the main roads of the rural villages.

CURRENT STATUS

From the 1970s many organizations, among them the Food and Agricultural Organization, promoted the cultivation of *Bidens pilosa* in Africa. However, its use has not become widespread due to the lack of knowledge about its preparation. While still common among some communities in rural Tanzania, especially those belonging to Arusha and Meru ethnic groups, the majority of the people consider kishonanguo a weed.

N. 15 KIZULU
(AFRICAN SANDALWOOD)

Osyris lanceolata Hochst. & Steud.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

MOROGORO REGION

SEASONALITY

HARVEST

JULY – DECEMBER

SENSORY ANALYSIS

VISUAL

LEAVES ARE NARROW AND OVAL, 1-7 CM LONG WITH A FINE, SHARP TIP, THE EDGES OF THE LEAVES CURL UNDER SLIGHTLY, FORMING A RIDGE. THE COLOUR OF THE LEAVES RANGES FROM GREY TO BLUE OR YELLOWISH GREEN. YOUNG LEAVES ARE FLESHY, BECOMING TOUGHER AND LEATHERY WHEN THEY GROW. THE FRUITS ARE ROUND, OVAL BERRIES, ABOUT 1 CM LONG, YELLOWISH GREEN WHEN UNRIPE, BECOMING A SHINY RED ONCE RIPENED. EACH BERRY CONTAINS ONE SEED.

TASTE AND CONSISTENCY

THE FRUITS HAVE A FLESHY TEXTURE AND ARE SWEET IN TASTE. THE LEAVES HAVE AN AROMATIC SCENT SIMILAR TO SANDALWOOD.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUITS, LEAVES, BARK, ROOTS

BEVERAGES, RAW

WAYS OF PRESERVING

DRYING

African sandalwood or *kizulu*, as it is called in the Pare language, is an evergreen, wild shrub or small tree that grows in the highlands of Tanzania as well as in Kenya, Ethiopia, Burundi, and South Africa. In Tanzania, kizulu is mostly found in the under-storey of highland forests, in forest remnants, on rocky ridges and mountain slopes, at an altitude that ranges from 1,500 to 2,500 metres above sea level.

It is a multi-purpose species that has been used traditionally by rural dwellers, who harvest various parts of this shrub from the wild.

The plant can be also be propagated from fresh seed and suckers, and used as an ornamental plant or for soil conservation. However, this practice is not well established among Tanzanian communities.

CULINARY USES

The ripe fruit is consumed raw, especially by children and herdsmen, and is eaten as a famine food. The roots and bark are used to make tea and as a tonic in soups. A traditional herbal tea is prepared with the leaves of this tree, that are first steamed and then dried in the shade. For the preparation of the tea, the dried leaves are simply added to boiling water. In addition, a decoction of the bark and heartwood is used to treat sexually transmitted diseases and anaemia.

Besides its alimentary and medicinal uses, the hard, strong, heavy wood of the kizulu tree is a valuable material for carvings, mortars, pegs, and building poles, as well as being a good fuel wood.

PRODUCT HISTORY

Several parts of the kizulu tree have been traditionally used for alimentary and medicinal purposes by rural and indigenous communities that have traditionally based their livelihoods on the use of the wild species found in the Miombo woodland. The Miombo woodland is the biome where this species is most commonly found.

Historically, kizulu has been exploited in most parts of Tanzania because of its sweet-scented wood which has been exported since the era of German administration, for the manufacture of cosmetics. The extraction and international trade of this species from Africa began in the early twentieth century following the decline in the resource base of Indian and Australian sandalwood. The roots and wood of this species were particularly sought after by cosmetics and perfumery industries in Germany, India, Indonesia and South Africa.

As a consequence of the growing demand for kizulu wood, harvesting intensified dramatically, thus affecting the availability of this resource. This is because the harvesting methods typically used require the removal of the roots, as they are believed to contain more oil. The increase in demand and attractive prices (that have grown exponentially due to the scarce availability of this resource) have further increased the pressure on this species.

CURRENT STATUS

The number of kizulu trees has declined drastically due to overexploitation and uncontrolled harvesting, to satisfy the international markets desire for expensive essential oil made from its roots. In the last decades, several initiatives have been undertaken to promote the cultivation of this tree among rural communities in Tanzania, as well as in other countries where this species was once common.

N. 16 KWEME
(OYSTER NUT)

Telfairia pedata (Sm.) Hook.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

ARUSHA REGION

SEASONALITY

HARVEST

END OF RAINY SEASON

SENSORY ANALYSIS

VISUAL

THE LONG FRUITS ARE ABOUT THE SIZE OF AN AVERAGE GOURD/WATERMELON AND CAN WEIGH UP TO 14 KG. THEY CONTAIN BETWEEN 80 TO 170 SEEDS. THE FLAT, ROUND SEEDS ARE 3 – 4 CM IN DIAMETER.

TASTE AND CONSISTENCY

THE SAND-COLOURED SHELL HAS A FIBROUS TEXTURE, WHILE INSIDE IS GREEN AND OILY, WITH A TASTE THAT IS REMINISCENT OF BROAD BEANS AND GREEN ALMONDS.

EDIBLE PARTS AND COOKING TECHNIQUES

SEEDS

RAW, ROASTED

WAYS OF PRESERVING

DRYING, FLOUR, OIL

The oyster nut, or *kweme* is the seed of the liana belonging to the Cucurbitaceae family. This species is native to Tanzania and northern Mozambique. It also grows in the hot and humid areas of central and eastern Uganda (where it is known as *kulekula*).

Oyster nuts grow on vines, which can reach up to 30 metres in length and prefer to climb on large trees. The vines produce large gourd-like fruits that contain the edible seeds. They begin producing fruits after two years and remain productive for up to 20 years.

This crop is one of the traditional shrubby species found in *kihamba* gardens, the traditional agroforestry system of the Chagga people.

Seeds obtained from trees in cold, rainy areas are considered of better quality than those from mountain plants. They are harvested when the fruit falls from the tree and break open at the end of the rainy season.

CULINARY USES

Seeds can be eaten raw or roasted and crushed in a mortar to create a paste to add to vegetable or meat dishes. Since the seeds usually have a bitter taste, they can be soaked for 8 hours in 3 changes of water. To remove the kernel from the shell, the fibrous husk is first partly cut away, then the shell is cracked and opened using a knife.

One popular Tanzanian dish includes roasted oyster nuts pounded into a paste, and cooked with fish wrapped in banana leaves.

The seeds are also pressed for cooking oil and the seedcakes left over from this process are excellent as livestock fodder.

PRODUCT HISTORY

In traditional Chagga society in Tanzania, oyster nuts are fed to nursing mothers to stimulate lactation and increase the flow of milk. Oyster nuts have, indeed, a very high protein content of about 27%, and approximately 68% oil content. Just 100 grams of oyster nuts contain 27 grams of protein and 68 grams of fat. This makes the seeds extremely nutritious and full of essential fatty acids.

Nowadays, oyster nuts are still collected for personal consumption but are no longer found in the local market, though local farmers have expressed interest in cultivating the trees if there were demand from consumers.

Theoretically, the creation of commercial chains for kweme could make an important contribution for the livelihoods of rural people. Under good conditions, two harvests per year are possible. Commercial plantations can reach an annual seed yield of 3 to 7 tonnes per hectare. Plants have an economic life of 10 to 20 years.

CURRENT STATUS

The use of kweme has decreased due to the introduction of species for oil production that are more productive and better suited to mechanization and industrial production. Two popular alternatives to kweme are sunflower and sesame seeds. Another reason this product is at risk of extinction is the low germination rate of the seeds (about 30%) in conditions where seed humidity is lower than 40%. As such, more information is needed on proper seed storage to cultivate this species.

Many organizations are promoting oyster nut cultivation as a way to restore the deforested area in the Kilimanjaro region, while giving local communities an alternative source of income due to an increase in demand of oyster nut products in Europe.

N. 17 MATANGO PORI
(BUR GHERKIN)

Cucumis anguria L.

CATEGORY

LEAFY VEGETABLES

PRODUCTION AREA

ARUSHA DISTRICT, ARUSHA REGION
SINGIDA REGION,
DODOMA REGION

SEASONALITY

HARVEST

JANUARY AND
MAY - JUNE

SENSORY ANALYSIS

VISUAL

FRUITS ARE APPROXIMATELY 4–5 CM LONG AND OVOID TO OBLONG SHAPED. THEY ARE COVERED WITH LONG HAIRS ON A SPINY SURFACE. WHEN UNRIPE, FRUITS ARE GREYISH GREEN WITH GREEN STRIPES AND THEY TURN YELLOWISH AS THEY RIPEN. THE INNER FLESH IS PALLID TO GREEN. LEAVES ARE FURRY AND LIGHT GREEN AND THEIR SHAPE IS SIMILAR TO THAT OF THE MAPLE LEAF.

TASTE AND CONSISTENCY

WHEN STILL GREEN, THE FRUITS HAVE A MILD FLAVOUR SOMEWHAT SIMILAR TO CUCUMBER, WITH SWEET AND SOUR, CITRUSY NOTES. AS THEY MATURE, THEY DEVELOP A TART AND BITTER TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUITS, STEMS, FLOWERS, LEAVES, SEEDS

RAW, BOILED, FRIED, STEWED

WAYS OF PRESERVING

DRYING

Matango pori is a herbaceous vine, native in its wild form to eastern and southern Africa, introduced to the Americas. It is a semi-wild species that descend from *Cucumis longipes* African wild species. Wild (bitter) population and naturalized (non-bitter) populations grow as a weed in cultivated fields. The plant spreads by seeds after becoming attached by animals. When farmers weed their fields and find matango pori plants, they let them grow. In so doing, they undertake kind of selection or support for the plant to be left in the field while other "weeds" are removed.

Harvesting of the fruits takes place in the immature stage while still green and the leaves can be collected for several months, especially during wet seasons. To have this vegetable also during the dry season, rural farmers sundry fruits during months of plenty and store them for times of scarcity.

CULINARY USES

Fruits and aerial parts are boiled, steamed, or fried. Fruits can be also eaten raw, usually without the skin in salads or *kachumbari* salad (tomatoes, onions, salt and seasoning). Seeds can be roasted to eat as a snack. Leaves are known in Kiswahili as *mlenda matango* and are cooked and eaten in the same manner as other leafy vegetables such as pumpkin leaves. To prepare them, cut leaves are boiled for 2-5 minutes and seasoned with crushed groundnuts. Dried leaves (*maimbe*) may be ground and crushed into smaller pieces before boiling.

PRODUCT HISTORY

For rural communities in semi-arid areas such as Singinda Region and some districts of Arusha, wild vegetables have a historically crucial role as famine crops. By integrating agricultural practices with the harvesting of wild resources, farmers have managed to cope with adverse climatic and environmental conditions, thus guaranteeing the food security of their households. This knowledge and the connected practices have been transmitted orally and are an important part in the management of natural resources, as well as in the process of biodiversifcation.

Wild edible plants represent an extra source of income for rural families, especially before the harvesting of crops starts. Farmers, especially women, collect fruits and green parts of matango pori and other wild species in the late afternoon and, in the early morning, they offer them in local and regional open-air markets. They take their products to marketplaces on foot or by *dala dala* (minibus share taxis).

CURRENT STATUS

Long dry periods have resulted in the reduced availability of wild and semi-wild species commonly used in the diet of rural populations. These plants are among the first to be harvested after the dry season, serving as an important food source during the hunger gap. Losing this important resource would affect the food security of several communities.

N. 18 MBULA
(FEVER TREE)

Parinari curatellifolia Planch. ex Benth.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

MBEYA REGION

SEASONALITY

HARVEST

MAY – JUNE
OCTOBER – DECEMBER

SENSORY ANALYSIS

VISUAL

FRUITS ARE GREENISH WITH PALE SPECKS WHEN UNRIPE, BECOMING YELLOWISH AS THEY RIPEN AND DARK BROWN WHEN DRY. THE PLUMS ARE OVAL AND GROW UP TO 5 CM IN DIAMETER. THE FIBROUS YELLOW FLESH CONTAINS A HARD STONE WITH ONE EDIBLE SEED KERNEL.

TASTE AND CONSISTENCY

THE FRUIT HAS A PLEASANT SWEET, ACIDIC TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUITS, LEAVES, SEEDS

RAW, BEVERAGES, BOILED

WAYS OF PRESERVING

DRYING

Mbula is a wild, evergreen tree growing up to 15 m tall found in the north and eastern part of Tanzania. Mbula naturally grows in open woodland environments and is commonly used as an indicator for the presence of water. It is not often cultivated but is normally foraged because it grows in the deciduous forests of Tanzania. The tree has corky, grey-black bark with streaks of red or pink. The flowers are small, pale or mauve in colour and sweet-scented. The mbula tree flowers from October to December. It has long flowering and fruit ripening periods. The fruit is collected from the ground after it has fallen from the trees.

CULINARY USES

The fruit may be eaten raw or added as a sweetener to maize porridge. A delicious syrup is prepared from mbula fruit and provides the basis of a refreshing, non-alcoholic drink. The fruit can be sun-dried and stored for later use.

Seeds are pounded and used for making soup and they can also be eaten and make a passable substitute for almonds.

A hot beverage made with the bark is used in the treatment of pneumonia. A leaf decoction is either drunk or used in a bath as a fever remedy. Crushed leaves are used in a dressing for fractures or dislocations, and wounds, sores and cuts.

PRODUCT HISTORY

Although they are not the only community that enjoys the fruit, the Nyamwezi people are the main collectors, consumers and sellers of mbula. The Nyamezi people are Bantu speaking people in western Tanzania.

Harvesting the wild fruit has long been relevant to the livelihood of the communities who live in the area, both medicinally and as food security.

Since the fruits of mbula spoil quickly, people usually process the fruits. Indigenous knowledge of processing and harvesting techniques are important for enjoyment, and this know-how also plays an important role in providing essential nutrients throughout the year for the community. Processing the fruit also adds value to the product when sold.

Mbula is sold in the market or collected for personal use. Rural dwellers commonly gather the fruit for personal use and to be sold at markets, whereas urban dwellers often collect them in larger quantities for larger distributors. This gives agency to many rural people to forage for the fruit and sell it fresh or processed to urban dwellers at markets. Women utilize foraged fruits and processed products as a source of income.

CURRENT STATUS

Due to alteration or disappearance of rural ecosystems and landscapes for urbanization, the future of the mbula tree and fruit is in question. The younger generation is more interested in living in cities and consuming imported exotic fruits rather than preserving the culinary and medicinal traditions connected to mbula.

N. 19 MCHICHA MAUA
(FLAME FLOWER)

Talinum portulacifolium (Forssk.) Asch. ex Schweinf.

CATEGORY

LEAFY VEGETABLES

PRODUCTION AREA

TABORA REGION
DAR ES SALAAM

SEASONALITY

HARVEST

DURING AND JUST AFTER THE RAINY SEASON.

SENSORY ANALYSIS

VISUAL

IT IS AN HERBACEOUS PLANT THAT GROWS UP TO 30 CM HIGH. STEM SUCKERS DEVELOP ONLY WHEN THE TERMINAL BUD TIP IS DAMAGED. IT CONTAINS SOFT FIBROUS TISSUE. LEAVES ARE SLIGHTLY FLESHY AND GREEN.

TASTE AND CONSISTENCY

SLIGHTLY SOUR TASTE AND WATERY TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, SHOOTS

BOILED, RAW

WAYS OF PRESERVING

DRYING

Mchicha maua is native to both Africa and the Arabian Peninsula. This long-lived, drought-resistant, herbaceous shrub is found throughout the tropics and grows easily across most of Tanzania's regions.

In Tanzania, the plant is only wild harvested and it is not currently cultivated on farms or in home gardens. Mchicha maua, as well as other leafy vegetables, are found near to the cultivated fields. It can be harvested two to three weeks after sprouting for culinary use, and if the terminal shoots are picked the plant will grow back, as it is a perennial wild species. Leaves and shoots are harvested when still young. Women familiar

with the species collect it and bring it home to cook it and feed their families. Harvesting is usually done on the journey back to the farm, or while collecting firewood. The leaves can be stored dry for later use and the plant is also used as a fodder for cattle and goats.

CULINARY USES

The tender leaves and shoots are commonly consumed as a vegetable like spinach and in soups, either cooked alone or mixed with other vegetables, such as the spider plant (*Gynandropsis gynandra*), and is served with a staple food like rice or *ugali*. It is usually cooked with oil, salt, and a bit of water, and can be eaten like a sauce with bananas, rice, chapati or ugali. The leafy stems are often cooked together with other vegetables or mixed with coconut milk or pounded groundnuts.

PRODUCT HISTORY

Locally known as mchicha, these wild, leafy vegetables play a crucial role in the diet of rural communities in Tanzania. It is mostly the elder women that have knowledge about the gathering and uses of these plants, and they pass it down to the younger women by involving them in its harvesting and preparation.

Besides its use as food, these plants are valued for their medicinal properties. For instance, a leaf decoction of mchica maua is traditionally used as a remedy for constipation and the plant is also credited with aphrodisiac properties.

Mchicha maua is traditionally harvested from the wild and used for home consumption. It is also available in small quantities at larger markets, such as the farmers market of Dar es Salaam.

CURRENT STATUS

Only a few people know how to use this plant in their kitchens, and a lack of transmission of this traditional know-how means the culinary use of this plant could be lost among younger generations. Local groups such as the Regent Estate Senior Women Group (RESEWO) work with the Village Museum in Dar es Salaam and are helping to spread awareness about the culinary and nutritional value of mchicha maua. This species is also one of the crops grown in the Bongoyo elementary school garden, a plot of land about 2,000 square metres, which is by students and teachers, who have attended a training course organized by Slow Food.

N. 20 MCHUNGA

Sonchus luxurians (R.E.Fr.) C.Jeffrey

CATEGORY

LEAFY VEGETABLES

PRODUCTION AREA

KONGWA DISTRICT, DODOMA REGION
MUHEZA DISTRICT, TANGA REGION

SEASONALITY

HARVEST

RAINY SEASON.
IT FLOWERS IN 60 DAYS.

SENSORY ANALYSIS

VISUAL

A ROBUST PERENNIAL HERB, ERECT OR TRAILING, 1-2 M IN HEIGHT. LEAVES ARE BRIGHT GREEN, VERY NARROW AND ALTERNATE WITH SPARSE LOBES ALMOST EXTENDING AT RIGHT ANGLES, WHICH CAN GROW UP TO 15 CM LONG. FLOWERS ARE YELLOW WITH NARROW PETALS AND THERE ARE WHITE WOOLLY INFLORESCENCE CLUSTERS BELOW THE FLOWERS.

TASTE AND CONSISTENCY

THE LEAVES ARE BITTER WITH MILKY SAP AND HAVE A SLIMY TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES

BOILED, STEWED, SAUTÉED

WAYS OF PRESERVING

DRYING

Sonchus luxurians is a common weed found in agricultural fields, especially abundant during the rainy season. In Tanzania, local people call it by its Shambaa name, *mchunga*, which means 'bitter'.

It is mostly found in disturbed areas, especially where animals graze. The bitter leaves are harvested from the wild and used as a vegetable or in traditional medicine. Moreover, it is considered a good fodder for livestock.

Though this plant grows wild, some farmers have started cultivating it in home gardens. It requires fertile soil and fertilization with animal manure and compost. Harvesting of wild

plants takes place mostly during rainy season while cultivated plants are ready to be harvested at its half-life, meaning 30 days after broadcasting. Once collected, mchunga can be sun-dried and stored for future use.

CULINARY USES

Mchunga is commonly used as a relish. The leaves are rubbed with salt, washed and boiled. They can then be sautéed alone or mixed with other vegetables of the genus *Solanum, Bidens or Galinsoga*. Alternatively, the leaves are stewed in coconut milk and seasoned with pounded groundnuts. These dishes are eaten alone or with staples such as *ugali*, rice or boiled cassava.

Though mchunga has an extremely bitter taste, people like it due to its unique flavour, which varies from all other vegetables.

PRODUCT HISTORY

Many communities in Tanzania have used this vegetable for a long time, reporting its usefulness in treating diseases such as diabetes, hernia, measles, malaria, stomach pain, blood pressure or body temperature problems, and skin afflictions.

In Muheza district, people use mchunga to increase the milk of lactating mothers, though only via external application, as it is a taboo for pregnant women and lactating mothers to eat this vegetable. Furthermore, children who have not yet reached walking age and children with high fevers (*ndegedege*) are not allowed to consume mchunga.

S. luxurians is more drought resistant than other vegetables and is rich in nutrients such as proteins, fat, calcium, iron, carbohydrates, phosphorus, and ascorbic acid.

Mchunga is sold on the market in plentiful supply during the rainy season. It is particularly popular in the eastern and central parts of Tanzania, especially in Tanga and Dodoma regions. Despite its high price, the demand for it is not yet been met.

CURRENT STATUS

Wild foods, such as mchunga, continue to have some dietary importance, although their availability and usage have decreased considerably along with habitat degradation and changes in eating habits.

Lack of knowledge among the younger generations on how to prepare them correctly may be another reason mchunga is less commonly consumed now than in the past.

N. 21 MDAMUDAMU
(ORANGE-MILK TREE)

Harungana madagascariensis Lam. ex Poir.

CATEGORY

FRUIT AND NUTS

OTHER NAMES

OMUJUMBO

PRODUCTION AREA

KAGERA REGION

SEASONALITY

HARVEST

AUGUST – DECEMBER

SENSORY ANALYSIS

VISUAL

THE FRUIT IS A SMALL DRUPE, ABOUT 3-4 MM IN DIAMETER, GLOBULAR IN SHAPE. THE FRUITS ARE GROUPED IN HEAVY MASSED HEADS 25-30 CM. THEY ARE GREENISH-ORANGE WHEN UNRIPE AND THEY BECOME RED WHEN MATURE.

TASTE AND CONSISTENCY

THE PULP IS SWEET AND JUICY.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

RAW

Harungana madagascariensis, or *mdamudamu* as it is known in Kiswahili, is a pioneer tree or shrub that usually ranges from 3 to 18 metres in height, with many branches that stem out from a cylindrical trunk. It is easily distinguished by the orange or blood-red resin that exudes from broken leaves, twigs, and cuts in the bark, as well as for sweet almond scent that its white flowers emanate when in bloom.

Mdamudamu grows in lowland and upland rainforests below 1800m above sea level, especially at forest edges, in disturbed areas, thickets, grasslands and around termite mounds. People collect the ripe fruit from wild plants and they eat it as a snack since it spoils quickly and cannot be stored.

CULINARY USES

Ripe fruits are edible. They are collected in handfuls and eaten as a snack. Children like mdamudamu since its taste is very sweet.

Several parts of the plant have been used in traditional medicine, especially by the Haya people, who call the plant *omujumbo*. The bark is used to treat malaria, the sap from the trunk is used in the treatment of scabies and tapeworm, and the leaves are rubbed on to treat headache. The roots are used to hasten breast development in young women while an infusion of the bark and roots is given to women to interrupt menses.

PRODUCT HISTORY

The Haya are one of the main ethnic groups in Tanzania. Their original land was in the western part of the Lake Victoria basin, and, even today, a great percentage of Haya people live in this area. The origin of this ethnic group can be traced back to Bantu-speaking people who migrated to the area over 2,000 years ago. The Haya social structure is based on patrilineal exogamous clans with each clan further divided into sub-clans. Traditionally Haya used to live in villages with several households surrounded by open bushland. They based their livelihoods on small-scale mixed farming, with bananas as a staple food and coffee as a cash crop. They also grow other crops such as cassava, sweet potatoes and yams in home gardens, usually placed close to the bush.

While, for Haya people, agriculture has been the main food production activity, they have always kept a strong relationship with the forest, as it was a source of timber, of food during famine periods and the place where important ceremonies took place. For instance, the bark and roots of mdamudamu are used to prepare traditional cosmetics such as toothpaste and lipstick. Moreover, the wood from this species was used for timber, fuelwood and the construction of tools such as grain mortars.

CURRENT STATUS

Although Haya people still hold rich and detailed knowledge of wild plants and herbs, among the younger generations this knowledge is fading due to increasing acculturation and migration to urban areas. On the other hand, the high rate of deforestation aimed at charcoal production has destroyed the local habitat, reducing the availability of wild plant species used as food and for non-alimentary purposes. For these reasons, mdamudamu and its associated knowledge are in need of attention.

N. 22 MGAGANI
(SPIDER PLANT)

Cleome gynandra L.

CATEGORY

LEAFY VEGETABLES

PRODUCTION AREA

ARUSHA REGION
DODOMA REGION

SEASONALITY

HARVEST

WHEN RAIN STARTS, AROUND MAY.

SENSORY ANALYSIS

VISUAL

AN ERECT HERBACEOUS ANNUAL HERB THAT CAN GROW UP TO 1.5 M IN HEIGHT. THE STEM AND LEAVES HAVE VARIABLE PIGMENTATION FROM GREEN TO PINK OR VIOLET TO PURPLE. THE SHAPE OF LEAVES VARIES FROM OBOVATE TO ELLIPTIC AND THEY ARE USUALLY 2-10 CM LONG AND 2-4 CM WIDE. THEY HAVE SPARSE HAIRS AND FINELY TOOTHED MARGINS OR ROUND ENDS.

TASTE AND CONSISTENCY

THE LEAVES HAVE A BITTER AND ASTRINGENT TASTE WITH A SPICY FLAVOUR THAT IS SIMILAR TO MUSTARD LEAVES.

EDIBLE PARTS AND COOKING TECHNIQUES

YOUNG LEAVES, YOUNG SHOOTS

BOILED, STEWED

WAYS OF PRESERVING

DRYING

Cleome gynandra or *mgagani*, as it is known in Kiswahili, is an annual wildflower species belonging to the Cleomaceaea family. Its origins are unknown, but many believe it to be native to eastern Africa and naturalized in many other parts of the world, where, unlike Tanzania, it is considered a weed or grown for its flowers.

It grows in poor or sandy soils, usually near human settlements in disturbed areas, as well as a weed in maize fields. It is a fast-growing plant and in the right conditions can be harvested in as little as three weeks after planting. While the species grows mostly wild, it is also suitable for intercropping with staple crops, enhancing crop productivity and nutrient use efficiency.

Farmers harvest the young green shoots and leaves before flowering. The leaves may be blanched, made into small balls, and sun-dried. Dry mgagani leaves can be stored for up to a year.

CULINARY USES

The tender leaves and young shoots may be eaten boiled as potherb, relish, stew or side dish. Fresh and dried leaves are utilized. In the latter case, they are soaked in water before cooking.

Given its very bitter taste, mgagani is usually mixed with other vegetables. In some rural districts of Arusha Region, people cook it with mild vegetables such as amaranth leaves, to improve the taste by increasing bitterness. In other instances, it is mixed with flame flower (*Talinum portulacifolium*), pumpkin leaves (*Cucurbita spp.*) or black nightshade (*Solanum nigrum*) to soften the bitter taste of mgagani. Pounded groundnut paste is added to dishes made with this plant for the same purpose.

PRODUCT HISTORY

In several Tanzanian communities, mgagani is appreciated since it is a fast-growing plant and resistant to adverse environmental factors. It is available before any cultivated vegetables can be harvested, making it important for food security for rural populations.

Moreover, its leaves are high in certain nutrients including antioxidants, amino acids, vitamins and minerals like calcium, magnesium, iron, beta-carotene and vitamin C. The leaves have also several traditional medicinal uses. Leaves and flowers can be used to treat ear problems, headaches, stomach pain, and high fever (*degedege*). Due to its quinine content, it has great potential to treat malaria. The plant is also known to have insecticidal properties as well.

During the rainy season, rural women sell green leaves and young shoots in rural and urban markets, though it is available in small quantities since farmers rarely cultivate it. The price for fresh leaves can double in value during the dry season when they are less readily available.

CURRENT STATUS

Mgagani consumption is limited due to several factors. On one hand, the quantity of this wild vegetable available is decreasing due to prolonged drought periods. On the other hand, the dislike of some people, especially young generations, hinders its consumption in favour of newly introduced vegetables, meaning that the knowledge and practices linked to this traditional plant are no longer passed on.

N. 23 MLENDA MBATA
(FALSE SESAME)

Ceratotheca sesamoides Endl.

CATEGORY

LEAFY VEGETABLES

OTHER NAMES

MLENDA WA SEGE

PRODUCTION AREA

KONGWA DISTRICT, DODOMA REGION
SINGIDA REGION

(COMMON IN TANZANIA, EXCLUDING NORTHERN AND SOUTHERN HIGHLANDS)

SEASONALITY

HARVEST

RAINY SEASON
(DECEMBER - MAY)

SENSORY ANALYSIS

VISUAL

A SMALL, HAIRY ANNUAL HERB, WITH GREEN LEAVES AND PINK OR LILAC FLOWERS, GROWING UP TO 1 M TALL. GROWTH CAN BE ERECT, BUT THE STEMS ARE MORE COMMONLY PROSTRATE. THE LEAVES ARE GREEN, VARIABLE IN SHAPE, AND USUALLY 8 CM LONG BY 4.5 CM ACROSS. THEY ARE TIP POINTED, TOOTHED OR LOBED AT THE BASE, HAIRY AND GLANDULAR BELOW, ON A HAIRY STALK. THE UPPER LEAVES ARE MUCH NARROWER WITH ONLY A FEW TEETH.

TASTE AND CONSISTENCY

BITTER TASTE AND MUCILAGINOUS TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, FLOWERS

BOILED, SAUTÉED, STEWED

WAYS OF PRESERVING

DRYING

Mlenda refers to different wild, drought-resistant species whose leaves become mucilaginous when boiled. The most common species are jute mallow (*Corchorus spp.*), wild simsim (*Sesamum angustifolium*), and false sesame (*Ceratotheca sesamoides*).

Ceratotheca sesamoides, locally known as *mlenda mbata*, is a wild leafy vegetable belonging to the Pedaliaceae family, native to Africa and commonly found in the central regions of Tanzania. It grows on sandy soils and at a range altitude of 800 - 1600m above sea level, spreading mostly in disturbed areas such as old pastoralist settlements and pastures where livestock usually graze.

The collection of mlenda mbata leaves takes place during the rainy season, though it can be found in smaller amounts throughout the year in fertile zones with good soil moisture. The leaves are usually collected in large amounts, dried in the sun before or after being steamed and stored. They can be also pounded and stored as a powder. Dried leaves can last for the entire dry season, which can last for up to 6 months. Women are usually in charge of the collection and processing of this vegetable.

CULINARY USES

Aerial parts (i.e. leaves and flowers) are eaten fresh or dried. Once collected, fresh mlenda is wilted in the sun and cooked alone, with fresh peas or other leafy vegetables. A paste made from groundnut is used to season this dish. People appreciate mlenda for its mucilaginous texture and they use it in soup or for the preparation of jelly sauces served along with *ugali*.

The sun-dried leaves are usually pounded into a powder with other dry vegetables such as okra (*Abelmoschus esculentus*), pumpkin leaves (*Cucurbita spp.*) and/or African nightshade (*Solanum nigrum*). The mixture is boiled into a thick paste, mixed with groundnut paste and eaten with starchy foods.

PRODUCT HISTORY

In Dodoma Region and other rural areas of central Tanzania, people value mlenda mbata for its healing properties and use different parts of the plant in traditional medicine. A decoction of the leaves is given to women recovering from childbirth. Moreover, leaves are soaked in warm water and the resulting slippery liquid is applied on the walls of the birth canal to facilitate the smooth passage of the baby during labour. Besides its medicinal properties, mlenda mbata leaves are a good source of protein (the dried leaves contain about 18% protein), lipids, and minerals such as potassium and calcium.

Traditionally, mlenda mbata played an important role in the local diet, especially during droughts and famine periods. Because it was easy to find, the plant covered a crucial role in the diet and the household economy of rural communities.

Due to its short harvesting season and the possibility to dry and store the leaves for long periods, mlenda mbata could fetch higher prices compared to other greens. However, its trade is mostly limited to rural areas and the amount sold is low as most families gather this species for home consumption.

CURRENT STATUS

Once visible both at the household level and in the markets, mlenda mbata has lost importance in the last decades, becoming one of the least common African leafy vegetables sold in the public markets of Tanzania. People stigmatize its consumption, considering it a "food for the poor". Also in rural areas, people tend to replace mlenda mbata with cultivated vegetables such as cabbage, kale, and spinach, as far as they can given their economic situation. Losing the traditional knowledge tied to this species could affect the resilience capacity of rural dwellers and affect their food security.

NOMINATOR: DAURO MATTIA ZOCCHI

N. 24 MLENDA MWITU
(WILD SISIM)

Sesamum angustifolium (Oliv.) Engl.

CATEGORY

LEAFY VEGETABLES

OTHER NAMES

ONYULO

PRODUCTION AREA

KONGWA DISTRICT, DODOMA REGION
MARA REGION

SEASONALITY

HARVEST

RAINY SEASON (LEAVES)
DRY SEASON (SEEDS)

SENSORY ANALYSIS

VISUAL

AN ERECT HERB THAT SOMETIMES SPREADS AND CAN GROW TO BE 30 -180 CM IN HEIGHT. THE LEAVES ARE LONG AND NARROW, APPROXIMATELY 12 CM LONG. THE LOWER LEAVES ARE COARSELY AND IRREGULARLY TOOTHED.

TASTE AND CONSISTENCY

THE LEAVES HAVE A SLIMY TEXTURE WHEN CRUSHED OR COOKED, SIMILAR TO THAT OF OKRA (*ABELMOSCHUS SPP.*), WITH A MILD TO SOUR TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES

BOILED, SAUTÉED

WAYS OF PRESERVING

DRYING

Mlenda is a Swahili word that Tanzanian people use for a group of species picked from the wild but occasionally planted on a small scale, especially in home gardens, that once cooked acquire a slimy texture.

Mlenda mwitu or *onyulo*, as it is called in Luo language, is a herb that grows in cultivated and disturbed areas such as wastelands, abandoned gardens and roadsides. It does well especially in sandy rivers soils at an elevation below the 2000m above the sea level. Though the plant is mostly gathered from the wild or as a weed in cultivated fields, some farmers deliberately plant it in home gardens.

The collection of mlenda mwitu leaves takes place during the rainy season. Women usually carry out this operation. Leaves are collected in large amounts and sun-dried. Dried leaves may be stored in a dark, dry place for a long time and used during the dry season.

CULINARY USES

Leaves are collected, chopped and cooked with other ingredients such as green vegetables, peas or beans. According to local women the leaves should be torn by hand and not with a knife as the latter "makes them too bitter". Milk or ghee may be added to reduce the bitterness of this vegetable.

Like other "mlenda species", mlenda mwitu is normally cooked as a potherb, in sauces, or added to dishes to improve their overall taste and texture. For instance, *Sesamum angustifolium* and *Corchurus spp*. are used as thickening agents and to give a slimy texture to different preparations. Mlenda mwitu is mixed with coarse vegetables to soften them.

The dry leaves are prepared in a similar fashion but used mostly during the dry season when other vegetables are not available. Among the Luo of Tanzania, the fresh leaves are added to a sauce with onions and tomatoes and served as an accompaniment to starchy foods such as *ugali*. Luo people also use the dried powdered leaves to add flavour and a slimy texture to soups. Dishes made with onyulo were traditionally prepared for ceremonies and other special occasions.

PRODUCT HISTORY

Luo are a Nilotic ethnic group living in western Kenya and the Mara Region of northern Tanzania. Luo moved from Lake Victoria into North Mara in the late 19 and early 20 centuries because of droughts, diseases, competition over pastoral resources, and the search for new arable lands. There are currently about 2 million people living in this region.

According to a local legend, a Luo woman, while walking in the bushes, found a plant and crushed its leaves between her fingers. She realised that the leaves were slimy. She thought the slimy sap would slide, as one does on mud, into the stomach and would help the swallowing of other foods. She started eating it regularly and afterwards, she convinced the members of her village to do the same. This long-standing myth demonstrates the importance of the slimy leaves of *Sesamum angustifolium* for Luo people. Onyulo is derived from nyulo meaning, "swallowing".

The relative importance of each species is also linked to its therapeutic, healing and aphrodisiac usages. The sticky crushed leaves have been also used to trap tsetse flies on cattle.

The trade of this vegetable is mostly limited to rural areas and the amounts sold are low since most of the families gather this species for home consumption.

CURRENT STATUS

Mlenda mwitu consumption is still widespread among the elder Luo people though its use has been decreasing for several reasons. On one hand, the available quantity of this wild vegetable is limited due to prolonged drought periods. On the other hand, the lack of knowledge regarding its culinary uses is leading to a decline of this product, especially among younger generations. It is important to protect mlenda mwitu for its cultural value as well as for its historical role in guaranteeing the food security of many rural communities.

NOMINATOR: DAURO MATTIA ZOCCHI

N. 25 MSASATI
(MVUMBA)

Vitex mombassae Vatke

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

ARUSHA DISTRICT, ARUSHA REGION
TABORA REGION

SEASONALITY

HARVEST

APRIL – SEPTEMBER

SENSORY ANALYSIS

VISUAL

THE FRUIT IS ROUND TO OBLONG, 2-3 CM LONG, GREEN AT FIRST, TURNING BLACK WHEN RIPE. CALYX LOBES ENLARGE, COVER THE FRUIT BUT LATER OPEN OUT OR BEND BACK.

TASTE AND CONSISTENCY

FRUITS HAVE A SHARP, PERSISTENT TASTE AND AN UNPLEASANT SMELL.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT, SEED, BARK

RAW, JUICE, JAM, TENDERIZER (BARK)

WAYS OF PRESERVING

FRUIT PRESERVE

Masasati is the fruit of a branched deciduous shrub or small tree species that can grow up to 8 m tall. It is a typical species of the Miombo woodland, growing in sandy soils on rocky hills up to 1600 m above sea level. It is abundant in open disturbed areas where natural vegetation has been partly cleared.

The fruit is usually collected from the wild, but the species is also protected on farms by the local people and propagated using fresh seed. Women have a central role in managing and ensuring that some wild trees of *Vitex mombassae* are left to grow in household farms. This practice makes the collection of wild fruit easier for the women who are responsible for this task. Women also collect fruit in the forest by picking the ripe fruit from the ground or shaking the branches with long sticks to make the fruit fall. Fruit is eaten soon after it is harvested because it can spoil very quickly.

CULINARY USES

Ripe fruit is a popular snack and refreshment especially in villages located closer to the forest. Herdsmen and children eat it.

The seeds inside the hard shell are edible too. Moreover, the wood ashes may be soaked in water, filtered and the liquid added to vegetables whilst cooking, to tenderize them.

The boiled, peeled fruit can be used for the preparation of juice and jams (Usually, the fruits are cooked in water and pulped with a pestle and mortar).

PRODUCT HISTORY

Miombo woodlands cover 90% of forested land in Tanzania. The majority of this ecosystem is located in the western part of the country. For a long time, the diversity of indigenous trees and plants has made a significant contribution to rural families in terms of energy, medicinal plants, food, and animal feed. Besides being an important supplementary source of food, wild fruit also constitutes the main source of of food during famine and is therefore regarded as a safety net.

Specifically, msasati fruit is rich in vitamin C and potassium. Several parts of the plant have been used in traditional medicine and the wood is a source of construction materials. The roots are boiled and the decoction used as a remedy for diabetes and infertility and as an antiemetic. Moreover, the tree provides good shade and is a source of bee forage.

Wild fruits are also an alternative source of income. During the harvesting season, women sell fruits in rural markets. They are the main actors in this business since wild fruit is carried in baskets that are culturally "not acceptable" to be carried by men (this limits the role of men in this activity).

The income generated from these fruits is very low because of poor markets and processing technologies, which lead to huge waste. To overcome these problems, several organisations have promoted knowledge, tools and facilities to process indigenous fruit and help local communities to create markets for these products. By promoting value-added products, it is hoped that farmers will be motivated to conserve forests and thereby enhance biodiversity and reduce environmental degradation.

CURRENT STATUS

In the last decades, several factors have led to the depletion of the Miombo woodlands, thus affecting the availability of wild fruits. In the Tabora region, tobacco leaf curing and cultivation as well as shifting cultivation are the main drivers of deforestation. At the same time, the weakening of traditional institutions has had a negative impact on the conservation of the ecosystem.

N. 26 NGOGWE MSHUMAA
(AFRICAN EGGPLANT)

Solanum aethiopicum L.

CATEGORY

VEGETABLES

PRODUCTION AREA

Arusha and Arumeru Districts, Arusha Region

SEASONALITY

SOW

Throughout the year

HARVEST

The first fruits come three months after sowing.

SENSORY ANALYSIS

VISUAL

The fruit has a size that ranges from 2 to 12 cm. This variety is similar to a tomato apart from its oval-shape and colour, which ranges from white, green or sometimes purple when unripe and orange, dark-red or shiny-brown when ripe.

TASTE AND CONSISTENCY

Different from other African eggplants, this variety is sweet and not bitter in taste.

EDIBLE PARTS AND COOKING TECHNIQUES

RIPE AND UNRIPE FRUIT

raw, boiled, stir-fried, stewed

WAYS OF PRESERVING

drying

African eggplants are bushy, perennial or annual plants native to the African continent. In Tanzania, they are called *ngogwe* or *nyanya chungu*, the latter meaning bitter tomatoes. In the national territory, different cultivar groups have adapted to a range of climatic zones during the domestication process.

The *gilo* group and the *tengeru white* are among the most cultivated and traded in Arumeru district in Arusha region. However, other local varieties exist among them.

Ngogwe mshumaa is an early-maturing variety with a long production period and a good resistant to drought. Smallholder farmers grow ngogwe mshumaa in kitchen garden plots,

with little or no use of external inputs (e.g. seeds, fertilizers, etc.). Fruits are harvested at different stages, both ripe and unripe and used in a variety of culinary preparations. They can be consumed fresh or sun-dried and preserved for later use.

CULINARY USES

The most common methods for cooking ripe fruits are boiling and stir-frying. Unripe ngogwe mshumaa are eaten raw or cooked in stews along with meat, pulses and/or other vegetables. Usually, dishes made with this variety are served with bitter and slimy vegetables such as *mchunga (Launaea cornuta), bamia (Abelmoschus esculentus), kibwando (Corchorus spp.)*, and *delega (Basella alba)*.

Due to the high content of spirosolane alkaloids, the excessive consumption of African eggplants is potentially harmful, especially if the fruit is eaten raw, blanched or steamed.

PRODUCT HISTORY

The African eggplant, especially fruits of bitter cultivars as well as roots and leaf juice, are used medicinally, for instance as a treatment high blood pressure. Nutritionally they have a good tenure of Vitamin A, (B2)/Riboflavin, Vitamin C, Calcium and Iron.

Compared to the tengeru white and other commercial varieties that are produced for the national market, ngogwe mshumaa is sold door to door, in local markets, and used for home consumption. However, when tengeru white is available in local markets, farmers face increased difficulty in selling traditional varieties.

CURRENT STATUS

Thanks to demonstration plots and agricultural fairs, African eggplant has become a popular vegetable in diets of ethnic groups that did not traditionally consume it. However, following the implementation of these initiatives, many farmers shifted from local varieties such as ngogwe mshumaa to tengeru white and furthermore, they uprooted traditional varieties when they grow in the field to prevent them from crossing with the new, improved ones. According to local farmers, this decision is motivated by the fact that commercial varieties require less attention since they are less susceptible to pests and diseases.

Although the consumption and use of traditional African eggplant varieties is still rooted in the practices and knowledge systems of Tanzanian rural communities, the current neglect and loss of processing knowledge may soon translate into disuse and eventual loss of these vital nutritional and economic resources.

N. 27 NTONGA
(MONKEY ORANGE)

Strychnos cocculoides Baker

CATEGORY

FRUIT AND NUTS

OTHER NAMES

MNTONGA

PRODUCTION AREA

TABORA REGION

SEASONALITY

HARVEST

THE TREE FLOWERS DURING THE RAINY SEASON AND ITS FRUITS RIPEN DURING THE DRY SEASON, 8-9 MONTHS LATER. RIPE FRUITS ARE COLLECTED FROM JUNE TO AUGUST.

SENSORY ANALYSIS

VISUAL

THE TREE PRODUCES GREENISH-WHITE FLOWERS AND FRUITS THAT ARE 2-7 CM IN DIAMETER WITH A SMOOTH, WOODY SHELL THAT IS DARK GREEN, MOTTLED WITH PALER GREEN. UPON RIPENING, THE FRUIT TURNS YELLOW. THE NTONGA FRUIT CONTAINS NUMEROUS SEEDS.

TASTE AND CONSISTENCY

THE PULP IS JUICY WITH A SWEET, ACIDIC TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT, ROOT

RAW, JUICE

Ntonga is the local name for the fruit of a shrub or small wild tree that grows 3-8 m tall, with thick, ridged, corky brown bark. This species is found growing naturally in all districts of Tabora in central Tanzania and in other regions such as Dodoma, Iringa, Mbeya and Lindi. It is considered one of the indigenous fruits of the Miombo woodland.

Ntonga trees grow at an altitude of 400-2000 m above sea level. Fruits are principally harvested from wild trees, though some farmers plant ntonga trees close their plots of land. Ripe fruit may be picked from the tree or collected from the ground. Alternatively, green fruit

can be picked from the tree and stored for ripening. Once harvested, the fruit can be stored for about two weeks, if kept in a cool, dry place.

CULINARY USES

Fruit is eaten as a snack, especially by children but also by adults. The fruit is also mixed with honey or sugar to treat coughs. The fruit is broken in half and the pulp is eaten raw. Seeds may be swallowed or discarded. Moreover, a non-alcoholic drink is made by soaking the pulp of the fruit in water and sweetening it with sugar.

The root is chewed for medicinal purposes. It can be chewed to alleviate eczema and is an alleged cure for gonorrhoea. Leaves are pounded and applied to sores.

PRODUCT HISTORY

The Miombo is a name for a biome that forms a broad belt across south-central Africa, running from Angola in the west to Tanzania to the east. The word is derived from a local name *Muuyombo*, which refers to the tree *Brachystegia boehmii*. This tree is one of the most important and widespread in the local biome. Nyamwezi people, as well as other local communities, have based their livelihoods on the plants and herbs found in the Miombo. Such species provide several goods and services including building materials, traditional medicines, and food, along with ecosystem services. In addition, local dwellers have a strong spiritual attachment to the tree, and the groves are places where many ceremonies and rituals take place. As it was considered a sacred place, the use of the biological resources was driven by ethical and religious principles that guaranteed a sustainable use of the available resources.

Ntonga is one of the most well known wild fruits among the Nyamwezi tribe, who mainly eat it fresh when it is in season. Besides its alimentary and economic role, ntonga trees are an important source of wood for tool handles and building materials. Moreover, ntonga fruit can also be used to make a dye and as a natural laundry detergent.

Nyamwezi people harvest ntonga fruit for personal use and also to sell in rural markets. However, it can be found in urban areas too, where migrants belonging to this ethnic tribe usually trade it.

CURRENT STATUS

There are records of high level of deforestation and forest degradation in Miombo woodlands. Due to these phenomena, ntonga and other valuable species are disappearing from the rural ecosystems and landscape. Moreover, due to the lack of attention from younger generations, who prefer eating exotic fruits rather than traditional ones, ntonga trees and the fruit are at risk of being lost as a food tradition. Losing the systems of customary rules that govern the use of biological resources could have a negative impact on the environmental sustainability of the Miombo woodlands.

N. 28 SAKULWIHE
(YOGA MCHWA)

Termitomyces clypeatus R.Heim

CATEGORY

FUNGI / MUSHROOM

PRODUCTION AREA

MOROGORO REGION
MBEYA REGION
IRINGA REGION

SEASONALITY

HARVEST

DECEMBER - JULY

SENSORY ANALYSIS

VISUAL

A MUSHROOM THAT USUALLY GROWS IN TERMITE HILLS IN THE FORESTS. THEY ARE WHITISH-BROWN OR GREY, WHICH MAKES THEM INCONSPICUOUS FROM A DISTANCE.

TASTE AND CONSISTENCY

IT IS DESCRIBED AS HAVING A TASTE SIMILAR TO COW'S TONGUE WHEN COOKED IN SOUP OR STIR-FRIED.

EDIBLE PARTS AND COOKING TECHNIQUES

MUSHROOM (FRUITING BODY)

BOILED, STEWED

WAYS OF PRESERVING

DRYING, SMOKING

The *sakulwihe* or *yoga mchwa* mushroom belongs to a group of fungi commonly called "termite mushrooms." It is an edible, high nutritional mushroom that usually grows in termite hills in the forests. The mycelium stage of the fungus takes place inside the termite hills, where the fungus assists in breaking down the cellulose in the wood that the termites use as a food source. They remain in this stage until triggered, usually by a large amount of rain, to grow through the roof of the termite nest and burst onto the surface as fully formed mushrooms.

Sakulwihe mushrooms grow during the rainy season. When they germinate, they are said to be ready for harvest. During harvesting, care is needed to ensure a product that can be successfully sold, because these mushrooms are known to be delicate and easily broken.

CULINARY USES

In times of plenty, the locals harvest the sakulwihe, soak them in cold water, cut into pieces, sun-dry or smoke them and store them to be eaten during off-seasons. According to the local collectors, preservation improves sensory and nutritional quality of the product, and also increases the market value of this wild, edible mushroom. The dried mushrooms are soaked in water for some time, and when soft enough, they are ready to be cooked. The locals in Mbeya and Iringa regions eat the mushroom in a soup with rice or *ugali*. During the harvesting season, they enjoy fresh sakulwihe two to three times a week. They consider the mushrooms a valid alternative to meat, which is similar both in taste and nutritional values.

PRODUCT HISTORY

Mushrooms are known as an important resource providing food and nutritional security, ingredients for folk medicine and also extra income to many rural communities in East Africa. They are an integral part of the traditional livelihoods of the Benna and Hehe, two ethnic groups found in the Southern Highlands of Tanzania.

Mushrooms such as sakulwihe have played a crucial role in the health of local people, given their important nutritional value as well as their various uses in traditional medicine. Several mushrooms of the Termitomyces genus are prescribed as a treatment for gastrointestinal diseases, constipation, and stomach ache.

The knowledge about the edibility of mushrooms is vertically transmitted from parents, grandparents, and other members of the community. The naming and classification of the fungal species take into account physical aspects such as colour, texture, smell, and place of growth and sometimes flavour.

Gathering and selling wild, edible mushrooms are socio-economic activities, which contribute to the wellbeing of rural communities. Knowledge and practices regarding mushroom collection and marketing are usually gender-oriented and dominated by women. Men do not engage in this activity due to the belief that mushroom collection and selling is for the lowly and poor, especially women.

CURRENT STATUS

While common in the past, the future of sakulwihe is under threat due to habitat degradation, climate change and anthropogenic activity, such as farming and overgrazing, with a lack of initiatives for restoration.

For now, the national government has paid little attention and made little effort to explore the role of mushrooms in improving food security and the socio-economic conditions of the rural population.

N. 29 UBUYU
(BAOBAB LEAVES AND FRUITS)

Adansonia digitata L.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

DODOMA REGION
ZANZIBAR ISLAND
(FOUND IN MANY SEMI-ARID AREAS OF TANZANIA)

SEASONALITY

HARVEST

FEBRUARY AND DECEMBER

SENSORY ANALYSIS

VISUAL

FRUITS ARE 20-30 CM LONG WITH AN OVOID, GREEN, WOODY SHELL. INSIDE ARE NUMEROUS HARD, REDDISH-BROWN SEEDS COVERED WITH A YELLOWISH PULP.

TASTE AND CONSISTENCY

THE RIPE FRUIT PULP HAS A SLIGHTLY SOUR TASTE.

EDIBLE PARTS AND COOKING TECHNIQUES

LEAVES, PULP, SEEDS

BEVERAGE, BOILED, STEWED

WAYS OF PRESERVING

DRYING

The baobab tree belongs to the family Malvaceae. It is a tall plant that can grow up to 25 m in height and may live for hundreds of years.

In Tanzania, where it is also known as *ubuyu*, this tree grows mainly in coastal woodlands, bushlands and wooded grasslands, in well-drained soils at an altitude below 1300 m above sea level.

Both the fruit and leaves are harvested for human consumption, mostly from wild trees. The former are harvested during the dry season, and often children, who like the colour of the seeds, assist in the harvesting. Once collected, the fruit can be sun-dried and stored for about a year. Leaves, on the other hand, are collected during the rainy season and usually consumed in their fresh form.

CULINARY USES

The fresh pulp is eaten as a snack or soaked in water, pounded, filtered and cooked with porridge. The filtered juice with some sugar added, can be drunk hot or cold.

The leaves are collected, chopped and boiled, and served with *ugali* and other starchy foods. Sometimes groundnut can be added to the cooked leaves.

Seeds are cooked or roasted, pounded and added to plant-based dishes. The seeds can also be fermented to create an alcoholic drink enjoyed by elders or boiled with water to produce a hot beverage, drunk in the mornings like coffee. To make this product, baobab fruit is opened and the seeds are separated from the pulp, peeled, sun-dried, and roasted in a pan. They are then ground into a fine powder in a wooden mortar. The seeds of the baobab can also be used to prepare a traditional sweet common on the islands of Zanzibar made with dyed red baobab seeds that have been boiled and coated in a mixture of sugar, salt, black pepper, cardamom, and vanilla.

PRODUCT HISTORY

Known as the "tree that fell from the heavens," the baobab is considered by many African communities as one of the most majestic and sacred trees, which provides shade, shelter, medicine and food and also plays an important role during famine times. The tree is often associated with longevity and increased immunity. It is a good source of protein and fat. Furthermore, the fruit have a higher vitamin C content than mangoes or oranges.

Baobab fruits and leaves are also used in folk medicine as an antipyretic or febrifuge to overcome fevers. Fruit pulp and powdered seeds are used in cases of dysentery and to promote perspiration.

Baobab trees provide income and employment to rural and urban households. In the past, the fruit, the fruit pulp, and the seeds were mostly sold in local markets both in urban and rural areas. Sweets made with the seeds are traditionally offered as a street food in markets in Zanzibar. Nevertheless, in the last decades, as a consequence of the boom of "super foods" consumption in the global market, an international trade for this product has emerged.

CURRENT STATUS

Several factors are leading to the decline of baobab trees in the semi-arid areas of Tanzania, thus challenging the conservation of this species and its associated knowledge. On the one hand, climate change is making this species weaker and more susceptible to drought, diseases, fire or wind. On the other hand, changes in the land use, due to the advancements in agriculture, have led to a reduction in the presence of this wild species. Finally, the global demand for baobab products has increased the pressure on this resource and pushed local communities to sell these products rather than use them for their own consumption. A decrease in the consumption of baobab products may lead to the erosion of the traditional food and medicinal knowledge and traditional practices connected to this species.

NOMINATOR: CHITOPELA AMANDU

NOTES

CHAPTER 3

PROCESSED PRODUCTS

N. 30 DENGE
(DENGELUA)

CATEGORY

DISTILLED AND FERMENTED BEVERAGES

PRODUCTION AREA

KILIMANJARO REGION

INGREDIENTS

SUGAR CANE (OR CANE SUGAR)

MMOMWE FRUIT AND SEEDS (*KIGELIA AFRICANA*)

STEMS OF *KISAPA* (*ALOE PLURIDENS* OR *A. VOLCANCE*)

PREPARATION METHOD

TO MAKE *DENGE*, BREWERS EXTRACT THE JUICE FROM THE SUGAR CANE, EITHER MANUALLY OR WITH AN ELECTRIC-OPERATED MACHINE, PUT IT INTO A CONTAINER AND ADD SLICES OF DRIED MMOMWE AND/OR STEMS OF *KISAPA* TO MAKE THE FERMENTATION START. THE FERMENTING AGENTS CAN BE REUSED MORE THAN TEN TIMES AND CAN KEEP FOR YEARS. WHEN FERMENTATION DOES NOT START, BREWERS ADD MORE SUGAR, HONEY OR OTHER FERMENTING AGENTS TO SPEED UP THE REACTION. USUALLY, THE FERMENTATION TIME RANGES BETWEEN 8 AND 9 HOURS BUT MAY BE LONGER DURING THE COLD SEASON. BREWERS JUDGE THE END OF FERMENTATION BY TASTING OR SMELLING THE DRINK. IN THE MAJORITY OF HOUSEHOLDS, DENGE IS PRODUCED IN THE FERMENTING VESSEL AND IS KEPT IN PLASTIC CONTAINERS OR BOTTLES WITH COVERS TO AVOID THE CONVERSION OF ETHANOL INTO ACETIC ACID. THE SHELF LIFE OF DENGE IS LESS THAN ONE DAY.

Denge or *dengelua* is a traditional fermented drink of the Pare tribe, an ethnic group indigenous to the Pare Mountains of the Kilimanjaro Region. It is made with sugar cane, fruits of *mmomwe* (*Kigelia africana*) and/or stems of *kisapa* (*Aloe pluridens or A. volcance*) that serve as fermentation starters.

Use of cane sugar replaces the cane juice when it is not available, typically in the rainy season when sugar cane pulp is too watery, or when the cane is not ripe enough. The addition of cane sugar helps to increase the alcohol content of the drink.

Mmomwe is a tree of the Bignoniaceae family, whose fruits are large grey-green sausages with several kilos of fibrous pulp surrounding the seeds. Slices of mature baked fruits are used to ferment different traditional drinks. In denge production, the seeds are also partly roasted and added to the mixture. However, if left in too long, the seeds render the drink poisonous.

Kisapa is a plant of the Liliaceae family, used in the treatment of burns, as an insect repellent, and for the preparation of other, different traditional medicines.

Denge has a whitish colour and a sour taste that varies according to fermentation time and the sugar content. The sweeter the sugar cane juice, the more sour the final drink.

PRODUCT HISTORY

The Pare is an indigenous community of agriculturalists, well known for their ability to build and maintain irrigation systems. From the 1940s the Pare Region flourished with the growth of the coffee economy, changing the traditional foodscape and the local agricultural system. Nowadays, the area's chief products are tea, coffee, sisal, (*Agave spp.), cinchona (Cinchona spp.*), and rice.

For Pare people, denge played a crucial role during social activities. After maintenance work on the irrigation systems, people would meet under the shade of a big tree and drink denge from a pot that rested in the roots of the tree. On these occasions, people discussed the distribution of water and offered libations to ensure success in irrigation.

At the same time, mmomwe has been traditionally used as a natural remedy for several health problems. The leaves and stem bark are used for the treatment of rheumatism, malaria, infertility, dysentery, epilepsy and headaches. The fruit is also used for the treatment of wounds and anaemia, especially in pregnant women. It has been also reported that the seeds are used in a brew, in order to enlarge the sexual organs.

Denge is produced at a household level and often sold in local bars in the rural areas of the Kilimanjaro region.

CURRENT STATUS

Denge spoils very fast, thus limiting the possibility to store and transport the drink. Moreover, some of the plants used to make the fermenting agents for denge have been reported to be toxic and only a few people still have the knowledge about how to use them correctly. On the other hand, the sausage fruits have become increasingly rare, due to many riverbeds where they grow drying up. As a result, this drink is being forgotten and replaced by commercially produced alcoholic drinks.

N. 31 KOMONI

CATEGORY

DISTILLED AND FERMENTED BEVERAGES

PRODUCTION AREA

SONGWE REGION

INGREDIENTS

GERMINATED MAIZE KERNELS

GERMINATED FINGER MILLET GRAINS

WATER

PREPARATION METHOD

TO PREPARE *KOMONI*, PRODUCERS PREPARE TWO KINDS OF PORRIDGE AND LATER MIX THEM. MAIZE AND FINGER MILLET SEEDS ARE SOAKED IN WATER FOR ONE DAY AND PUT INTO A BAG FOR 2 DAYS. THEN, THEY ARE SPREAD ON THE FLOOR OF THE ROOM, SUN-DRIED FOR 2–3 DAYS, AND, EVENTUALLY, MILLED INTO FLOUR. LATER THE FERMENTED PORRIDGE IS PREPARED BY MIXING FLOUR AND WATER, FERMENTING THE MIXTURE FOR AT LEAST 2 DAYS, BOILING FOR 9 HOURS AND THEN COOLED AT ROOM TEMPERATURE. ON THE OTHER HAND, THE SWEET PORRIDGE IS MADE BY MIXING THE TWO FLOURS WITH WATER AND BOILING THEM FOR 5 HOURS, OCCASIONALLY STIRRING. EVENTUALLY, THE TWO PORRIDGES ARE MIXED AND INCUBATED FOR AT LEAST 12 HOURS, FILTERED AND STORED IN PLASTIC CONTAINERS IN A COOL AND DARK PLACE.

Komoni is a fermented drink made from germinated maize and/or finger millet, locally known as *kimea wa mahindi* and *kimea wa ulezi*. During its preparation two different kinds of porridge, one "sweet" (*nyambo*) and the other "sour" (*kikonde*), are mixed and left to ferment. The resulting beverage is a turbid beer that is whitish in colour and sour in taste.

Germinated maize flour is usually made from old grains that have been stored for up to a year. According to local brewers, using older seeds helps start the fermentation process (i.e. the source of the yeast for the fermentation is higher in old grains).

This brew has been traditionally linked to the Gogo people living in the Songwe Region. They prepare two other brews with the same ingredients, namely *kimpumu* (straw beer) and *kiambule* (hybrid straw beer).

PRODUCT HISTORY

Alcoholic beverage production has always been a women's task in many Tanzanian communities, and the same applies to the Gogo people. In pre-colonial times women made alcohol for rituals led by elders and social gatherings when men shared food and drink after agricultural work in the fields. Traditionally, Gogo women prepared komoni for recreational and ritual purposes. It was a common beverage during social local markets, known as *minada*, and during cultural dances such as *nindo* and *mheme*.

However, in the colonial times and after independence, a trade of artisanal alcoholic brews grew, transforming this activity into a potential livelihood strategy and source of income, especially for women. In rural villages in the Songwe Region, there are several local brew clubs managed by women and the number is steadily increasing.

In contrast to other businesses, little capital is required to start this activity since women usually make the beverage by using the crops they grow in their family fields. Moreover, the income from this activity plays an important role in covering school, food and medical expenses as well as in supporting agricultural activities.

CURRENT STATUS

While in Tanzania traditional brews still account for a great percentage of the national alcohol consumption, they are increasingly losing importance in favour of Western alcoholic drinks such as beer. Today an influx of beverages made outside the area has created a preference among younger generations for the standardised tastes of these modern drinks. Moreover, among the traditional brews, komoni and other grain-based drinks are less popular than bamboo wine also because it has a shorter shelf life, which is a challenge to commercialising them on a broader scale.

N. 32 MATOBORWA

CATEGORY

VEGETABLE PRESERVES

PRODUCTION AREA

TABORA REGION
WESTERN AND LAKE ZONES

INGREDIENTS

SWEET POTATO ROOTS
(IPOMOEA BATATAS)

PREPARATION METHOD

TO MAKE MATOBORWA, THE FRESH SWEET POTATO ROOTS ARE FIRST BOILED IN WATER FOR 30-40 MINUTES, AFTER WHICH THEY ARE PEELED, SLICED AND DRIED IN THE SUN. IN RURAL VILLAGES, WOMEN CARRY OUT THIS WORK MANUALLY. THIS WAY OF PROCESSING SWEET POTATOES ENSURES THAT THE ROOTS CAN BE FOR STORED UP TO 12 MONTHS AND ARE LESS LIKELY TO BE ATTACKED BY PESTS.

Matoborwa is a locally processed food made from boiled and sundried sweet potatoes *(Ipomoea batatas)* roots. This product, along with *michembe* (sun-dried roots), is tied to the food cultures of the communities living in the Western and Lake zones, especially the Nyamwezi and Sukuma tribes.

The resulting dry slices are mostly brown in colour, quite sweet, with a very brittle, hard consistency. They are usually soaked into water and used as an ingredient for soups and stews. Matoborwa can also be milled into flour and used as a substitute of maize flour for the preparation of *ugali*. When women prepare dishes with processed sweet potato, they usually mix matoborwa with michembe to decrease the sweetness of the former.

PRODUCT HISTORY

The technique for processing sweet potatoes was first developed by Nyamwezi tribe of Tabora region in Western Zone and Sukuma in the Lake region of Tanzania.

According to the local Nyamwezi elders, the name Tabora originated from the word matoborwa, meaning "sweet potatoes," which was a staple food for this tribe, who form a large part of the population of the Tabora region. Visitors could not pronounce the word matoborwa and, instead, they called it *tobora*, which later on came to be known as Tabora, the name of the community.

This sweet potato processing technique has now spread to other zones and people. Thanks to this processing method, sweet potatoes can be stored for several months and the period of consumption extended beyond the harvesting season. For this reason, matoborwa, along with other processed products made from sweet potato roots such as *vichembe*, have covered a crucial role for the food security of rural communities in Tanzania.

Matoborwa is made for home consumption with limited commercialisation, as due to the higher cost of production, it is not competitive with other products that can be processed in a cheaper industrial way.

CURRENT STATUS

Once, traditional preparations made with sweet potatoes, such as matoborwa, were staple foods, usually served twice a day (at the morning and evening meals). Today, they have lost their status due to changes in consumers' preferences, from traditional foods to wheat and rice-based products, and fresh sweet potato roots instead of the dry ones. Moreover, slicing and drying by hand are time consuming and labour intensive activities, so now people tend to purchase dried foods from the market rather than produce them at home. Because of these dynamics, future production and consumption of traditional foods like matoborwa are at risk of being lost.

N. 33 MBEGE

CATEGORY

DISTILLED AND FERMENTED BEVERAGES

PRODUCTION AREA

KILIMANJARO REGION
MERU REGION

INGREDIENTS

BANANA

SPROUTED FINGER MILLET (*ELEUSINE CORACANA*)

MSESEWE (STEM BARK OF *RAUVOLFIA CAFFRA*)

PREPARATION METHOD

THE PRODUCTION OF MBEGE INVOLVES THREE MAIN STEPS: *NYALU* PREPARATION, *MSO* PREPARATION, AND MIXING. FIRST BANANAS ARE PICKED UNRIPE AND LEFT TO RIPEN IN A WARM DARK PLACE. FOR THE PREPARATION OF NYALU, RIPE BANANAS ARE PEELED AND COOKED UNTIL THEY BECOME SOFT. IF BREWERS USE *MSESEWE*, THEY ADD THE POWDER INTO THE MIXTURE AFTER COOKING. THE MIXTURE IS LEFT TO REST FOR 2-3 DAYS BEFORE ADDING WATER AND THEN THE RESULTING MIXTURE IS KEPT RESTING FOR ANOTHER DAY. FINALLY, IT IS FILTERED USING A NYLON BAG. AT THE SAME TIME, *MSO*, A THICK PORRIDGE MADE OF GERMINATED FINGER MILLET, IS PREPARED BY MIXING WATER WITH THE GROUND FINGER MILLET AND THE MIXTURE IS BOILED. MSO IS LEFT TO COOL AND THEN MIXED WITH THE NYALU IN A WOODEN BARREL. THIS MIXTURE, CALLED *TOGWA*, IS LEFT TO FERMENT FOR 1-2 DAYS AND, EVENTUALLY, MBEGE IS OBTAINED.

Mbege is banana beer made from ripe bananas and finger millet. It is among the most popular indigenous alcoholic beverages in the north-eastern part of Tanzania. Mbege is still part of the traditional food heritage of the Chagga and Meru people living in villages on the lower slopes of Mt. Kilimanjaro in the Kilimanjaro region and Mt. Meru in the northern part of Tanzania.

Several varieties of banana can be used in the preparation of this brew. Among the most suitable are *ndizi ng'ombe, ndizi ndishi,* and *ndizi ifanaiya.*

The ingredients and the preparation method of mbege change slightly according to the area and knowledge of the brewer. For instance, in some recipes, the stem bark of *Rauvolfia caffra*, locally known as *msesewe*, is added. This part of the plant is dried, made into a powder and finally added to the beverage. According to the local brewers, it helps to accelerate the fermentation process, and it increases the ethanol concentration of the brew. Moreover, it gives a bitter aftertaste to the drink.

Generally, mbege has a sweet and sour taste, a porridge-like consistency, and a light brown/reddish colour.

PRODUCT HISTORY

Mbege is a culturally important beverage for the Chagga, a Bantu-speaking indigenous group and the third largest ethnic group of Tanzania. Traditionally, women only used to prepare this brew for special occasions and traditional ceremonies such as dowry payments, weddings and funerals. Mbege was also an important drink during social gatherings for Chagga communities in the Arumeru district in the Arusha region. Men usually shared a glass of mbege while they sat at home together talking, singing merrily and discussing things concerning their clan.

Other ethnic tribes also consider mbege a part of their food traditions. For instance, the Meru have traditionally prepared the brew along with honey wine. Meru people used both the beverages as payment for food and other goods and as a gift for the spirits of their ancestors.

Currently, mbege is made for both home consumption and commercial sale. Women usually sell the brew in small shops and bars in the village. The trade of indigenous alcoholic beverages represents an important source of income for rural households, especially at times of the year when no or very few agricultural products are available for sale.

CURRENT STATUS

Although indigenous alcoholic beverages are still produced and consumed, mbege and other traditional brews tend to be more popular with older generations, while younger people generally prefer to drink imported alcoholic beverages instead.

Production is also at threat due to the decrease in the number of farmers that still grow finger millet, as many have switched to cultivating maize and other cash crops. Industrial breweries produce commercial versions of mbege, but the traditional know-how of preparing this drink in the home with local ingredients is being lost.

N. 34 MICHEMBE

CATEGORY

VEGETABLE PRESERVES

PRODUCTION AREA

LAKE AND WESTERN ZONES OF TANZANIA

INGREDIENTS

SWEET POTATO
(IPOMOEA BATATAS)

PREPARATION METHOD

MICHEMBE IS MADE THROUGH A LABOURIOUS PROCESS THAT INVOLVES FIRST DRYING THE TUBERS IN THE SUN FOR 1 – 3 DAYS TO REDUCE THEIR WATER CONTENT. THE INITIAL DRYING MAKES THE TUBERS EASIER TO SLICE, AS THE SLICES HAVE LESS OF A TENDENCY TO BREAK APART. THE TUBERS ARE THEN HAND-PEELED AND SLICED INTO THIN HORIZONTAL STRIPS, WHICH ARE INDIVIDUALLY SUN-DRIED A SECOND TIME. THE CHIPS ARE DRIED ON A VARIETY OF SURFACES, FROM THATCHED ROOVES, CORRUGATED IRON ROOVES, CHICKEN WIRE FENCING, WOODEN DRYING RACKS OR IN COURTYARDS. ONCE DRY, THE SLICES OF SWEET POTATO ARE STORED IN A COOL PLACE INSIDE THE HOUSE. PROCESSING OF SWEET POTATOES IS CARRIED OUT AT THE FAMILY LEVEL AND IT IS MOSTLY WOMEN THAT ARE INVOLVED IN THIS ACTIVITY.

Michembe is a chip or crisp-like product made from sweet potato (*Ipomoea batatas*). Each piece is between 7 – 10 cm long and roughly oblong: its shape varies depending on the potato.

For producing michembe, farmers use white-fleshed tubers that are considered less sweet than the orange sweet potato varieties.

The sweet potato is a staple crop for most urban and rural households. The crop adapts well to different environments, and it is drought-resistant. People grow it for both home consumption and to sell at the market. Although the sweet potato is a crop spread all over the region, its cultivation is labour intensive and generally requires the use of hand hoes.

In the lake zone, farmers plant sweet potato from October to March and from June to September. Harvesting takes place from February to June and October to January. In the western zone of Tanzania where there is a long rainy season, the tubers are planted between March and May and are harvested from July to September.

PRODUCT HISTORY

This technique for processing sweet potato was first developed by the Sukuma and Nyamwezi tribes in the lake and western zones of Tanzania. The local Nyamwezi people refer to the product as *makewe*, while the Sukuma call it *mapalage* or michembe.

The Sukuma and Nyamwezi are two closely related ethnic groups that live in the southwest area of Lake Victoria. The populations are large and mobile throughout the region.

This drying technique has now spread to other areas, such as the Usangu Plain in the southern highlands, which is inhabited by the Sukuma people.

Michembe has served as a famine relief food during the dry season. Drying the sweet potatoes in this way is an attempt to preserve the tubers for long periods as a snack food, rather than letting them go to waste. In the form of michembe, the potatoes can last from 5 to 8 months, which is significantly longer than the fresh tubers. Because of this, the product is one that represents a refuge during food shortages.

In addition to this, the complex process by which the chips are dried is a testament to cultural knowledge held by the groups who created it.

Michembe is made for home consumption and generally sold commercially in local markets and shops. Farmers sell the product directly to the consumers or through the middlemen that bring the product from the villages to retailers or consumers in urban centres.

CURRENT STATUS

Although it was once considered a staple food, usually served twice a day, michembe has now lost its status due to changes in consumer preferences, which have shifted away from traditional, locally produced foods to eating wheat and rice-based products that are commonly available in local shops. Therefore, the tradition of preparing and consuming michembe is at risk of being lost.

N. 35 NGARARIMO

CATEGORY

VEGETABLE PRESERVES

PRODUCTION AREA

ROMBO DISTRICT,
KILIMANJARO REGION

INGREDIENTS

WHITE MAIZE

RED KIDNEY BEANS

MAGADI
(SODA ASH)

SALT

PREPARATION METHOD

THE PREPARATION OF *NGARARIMO* ENTAILS BOILING THE CORN AND BEANS IN A CLAY POT ON A WOOD FIRE. THE GRAINS AND PULSES ARE MIXED TOGETHER AND COOKED UNTIL SOFT. TO LIMIT THE WATER EVAPORATION, THE POT IS COVERED WITH BANANA LEAVES. AFTERWARDS, THEY ARE MASHED TO CREATE A THICK PASTE. NO ADDITIVE APART FROM *MAGADI* AND SALT ARE ADDED TO THIS PREPARATION. ONCE COOKED, NGARARIMO CAN BE EATEN FRESH OR STORED IN CLAY POTS IN A COOL, DRY PLACE FOR LATER USE.

Ngararimo is a traditional food tied to the food culture of the Chagga communities living in the Kilimanjaro region, especially in the Rombo District. It consists of white maize kernels and red kidney beans cooked together with bicarbonate of soda in an original form known as *magadi* in Kiswahili.

Maize is planted during the same season, between February and March. Harvesting takes place 6 months after planting, usually around September. It is a common practise for beans to be planted alongside maize.

Ngararimo can be stored for up to 1 week without going bad. In fact, magadi acts as a preservative for this dish and it has been traditionally used as a natural preserver when no refrigeration systems were available. In addition, magadi helps to soften grains and vegetables and reducing their cooking time.

PRODUCT HISTORY

For centuries ngararimo has been a traditional staple food of the Chagga people. It was eaten either for breakfast, lunch or dinner. It has covered an important role as a staple food since it has a great nutritional value: it is indeed a whole meal, which contains carbohydrates, proteins and vitamins. It was purposely prepared for home consumption, and the meal was shared by everybody in the family. Ngararimo was also prepared during communal activities and social gatherings.

Maize and beans have traditionally played an important role in the livelihoods of Chagga people living in the Rombo District, as well as in order rural areas of the Kilimanjaro region. Such crops have been used both as a staple for home consumption and for sale at a local level.

Ngararimo is still prepared in rural areas, mostly for home consumption, and especially by elder women who still have detailed knowledge about how to prepare this meal. Nowadays many families prepare a modern version of the dish, that can include oil, coconut milk, carrots, onions, tomatoes, and other vegetable ingredients.

On some occasions, ngararimo is offered in local restaurants. For instance, a version of this meal made with vegetables, local banana varieties, and oyster nut is served by local cooks that are involved in the Mangulwa Earth Market, an initiative promoted by the Kilimanjaro Slow Food Convivium and hosted by the Mviwata Kilimanjaro organisation in Mangulwa village located in Rombo District. The market hosts farmers and the communities nearby, such as those from Mashati, Ubaa, and Useri villages.

CURRENT STATUS

The traditional method of cooking ngararimo is disappearing as a consequence of the changes in the dietary habits of local communities, as more people have access to modern ingredients and additives.

Moreover, intergenerational knowledge transfer regarding this recipe has been interrupted and this leaves the young people with inadequate information that cannot help to safeguard this product. In addition, cooking this meal in the family is viewed as a sign of poverty, which is why people are reluctant to prepare it.

N. 36 NSWALU
(DRIED WILD JUTE AND PUMPKIN LEAVES)

CATEGORY

VEGETABLE PRESERVES

PRODUCTION AREA

Dodoma Region
Tabora Region

INGREDIENTS

Young *mlenda* leaves (*Corchorus trilocularis*)

Pumpkin leaves (*Cucurbita* spp.)

PREPARATION METHOD

The fresh harvested, wild *mlenda* and pumpkin leaves are sun-dried separately on rocks, on top of plastic bags or tarps or in courtyards. Normally, it takes three to five days for the leaves to dry completely, depending on weather conditions. The dried pumpkin and wild mlenda leaves are then mixed in a ratio of 3 to 1, and the mixture is stored in earthenware pots, willow baskets, paper or plastic bags for up to twelve months without any signs of deterioration. Usually, women take care of the harvesting of the leaves and the processing of *nswalu*.

Nswalu is an artisanal processed product made of dried *mlenda* (*Corchorus trilocularis*) and pumpkin (*Cucurbita* spp.) leaves. The plant leaves are dried then ground into a powder.

This artisanal processing technique is common to Gogo and Nyamwezi tribes who inhabit the areas of Dodoma and Tabora in the central and western zones of Tanzania respectively. The Gogo people mostly live in rural areas, and they rely mainly on small-scale agriculture. The Nyamwezi are also agriculturists who rely on traditional farming techniques.

As in the past, most of the farming today is done manually, though some people use tractors and animals too. The major crops in agricultural communities are sorghum, millet, maize, rice, sweet potatoes, cassava, peanuts, beans, chickpeas, gourds, sunflowers, pumpkins, cotton, and tobacco. While pumpkin leaves come from the cultivated pumpkin plants, mlenda plants grow wild on the edges of the cultivated fields and in the bush.

PRODUCT HISTORY

The Gogo and Nyamwezi live in areas where rainfall is often unreliable. Consequently, they long ago developed techniques, such as ridging their fields, to conserve water. Within the household, women are responsible for many of the daily chores, such as weeding crops and cooking. Men are responsible for building the house and clearing the fields. Girls help their mothers with household work, while boys help with herding the livestock.

The two regions, Dodoma and Tabora, are categorised as dry and semi-dry areas, with a single rainy season per year. During the rainy season, there is an abundant supply of vegetables (including wild mlenda and pumpkin), and there is a scarcity of the same in the dry season. Thus, Gogo and Nyamwezi developed this technique to fulfil the demand for vegetables throughout the year.

Nswalu is served with *ugali*, a porridge-like dish made of cornflour. To serve nswalu, the mixture is first pounded with a mortar and pestle and then sieved to obtain a fine powder. This powder is then mixed with water (in varying amounts, depending on the preferences of the person cooking), and boiled over a low flame for twenty to thirty minutes. This slow cooking ensures that the product does not get a burnt flavour and that it cooks thoroughly. Raw groundnuts may also be pounded and added to the mixture whilst it is cooking.

CURRENT STATUS

In many developing countries, of which Tanzania is not an exception, more people, especially younger generations, are migrating to towns and cities away from their skilled elders. This migration interrupts the transmission of know-how between the generations, putting nswalu at risk of disappearing.

N. 37 NTWILI
(TUI LA KARANGA)

CATEGORY

VEGETABLE PRESERVES / OIL

PRODUCTION AREA

MOROGORO REGION

INGREDIENTS

GROUNDNUTS
(*ARACHIS HYPOGAEA*)

PREPARATION METHOD

THE GROUNDNUTS ARE ROASTED OVER A MEDIUM FLAME IN EARTHENWARE OR ALUMINUM POTS FOR TEN TO TWENTY MINUTES. THE OUTER SKIN OF THE NUTS IS REMOVED, AND THE NUTS ARE MASHED IN TWO STAGES. THE FIRST OCCURS WITH A MORTAR AND PESTLE, RESULTING IN A COARSE GRIND. THEN, THE CRUSHED GROUNDNUTS ARE PRESSED OR ROLLED OUT ONTO A HARD SURFACED TO CREATE A FINE, SMOOTH PASTE.

Ntwili is an oily paste made of locally grown, shelled and roasted groundnuts (*Arachis hypogaea*). Ntwili is made from locally grown groundnuts and is still prepared at the household level, especially among the people belonging to the Nyamwezi tribe.

The paste is thick and oily, dark brown in colour and it has a strong taste of roasted seeds. The paste is often used to flavour dishes during cooking.

PRODUCT HISTORY

The cultivation of the groundnut is tied to the colonial history of Tanzania, especially to the Tanganyika groundnut scheme. It was an attempt made by the British government in the 1940s to cultivate tracts of its African colonies with this legume, in order to cover a shortage of cooking oil in Britain. The project entailed the clearing of woodlands and bushes to create space for groundnut cultivation. When a great portion of land was already cleared, the project was abandoned as unworkable in 1951 at considerable cost.

On the other hand, groundnuts are part of the diet of different Tanzanian communities such as the Nyamwezi tribe. During the harvest season, it is a tradition for women to prepare ntwili and use it when cooking for their families. Groundnut oil and fat hold a pivotal role in the Tanzania cuisine, as well as in other culinary traditions of East Africa.

Ntwili can be stored for up to six months in a traditional wooden container (*kilindo*) or a plastic container. It is used as cooking oil to give flavour to foods. It is used in the preparation of many traditional vegetable-based dishes, like *nsansa* (a dish made with cowpea leaves), and to flavour legumes. Ntwili is made for both family use and for sale locally.

CURRENT STATUS

Today, ntwili is considered too laborious to produce according to lengthy traditional methods. Where it was once common, it is now being replaced more and more frequently with industrially prepared commercial cooking oils.

N. 38 PEPETA

CATEGORY

CEREALS AND FLOURS

PRODUCTION AREA

MOROGORO REGION
IRINGA REGION

INGREDIENTS

RICE

WATER

PREPARATION METHOD

PEPETA IS MADE WITH EARLY RICE THAT STILL RETAINS ITS MOISTURE CONTENT OR WITH MATURE RICE THAT HAS BEEN SOAKED OVERNIGHT. THE RICE IS FRIED IN A TERRACOTTA (*CHUNGU*) OR ALUMINIUM (*SUFURIA*) CONTAINER UNTIL THE GRAINS BEGIN TO CRACKLE, BEING CAREFUL NOT TO DRY THE RICE TOO MUCH. SUBSEQUENTLY, THE RICE IS CLEANED TO REMOVE THE CHAFF, AND THE CLEAN GRAINS ARE CRUSHED TO REMOVE RESIDUE CHAFF AND TO FLATTEN THEM. THE RICE GRAINS ARE CLEANED ONE LAST TIME, AND THEN THE PEPETA IS PACKAGED AND IS READY FOR SALE AND CONSUMPTION.

Pepeta is a chewing-gum type snack that is made from fried, ground local rice varieties. It is produced in the Kilombero Valley in the central-eastern area of Tanzania. It is often prepared with early rice with a water content of 40 - 50% or with mature rice left to soak overnight. Pepeta is chewed but not swallowed, like a gum.

Pepeta is considered of best quality if prepared with local, aromatic varieties including *Chamota, Jaribu, Kalamata, Katumahi, Kisegese, Limota, Mbawambili, Mwangaza, Pishori, Rangi Mbili, Supa Kijivu, Wahiwahi* and *Zambia.*

PRODUCT HISTORY

The rice-based gum holds cultural significance in addition to being a common snack, especially for the Pogoro communities living in Iringa and Morogoro regions. The Pogoro are Bantu agriculturalists that live in the southwestern part of central Tanzania, in what is now the administrative District of Ulanga. Locally, pepeta is a well-known product, prepared during the harvest season. It is often offered to companions and friends as a sign that a meeting is over and that it is time for celebrations and fun.

Some studies have highlighted the nutritional benefits of pepeta, because its sole ingredient is immature rice grains. Unripe rice grains contain a high amount of nutrients, including micronutrients such as B vitamins and specific minerals. Also, the applied thermal processing significantly reduces losses of water-soluble constituents such as B vitamins, sugars and most minerals.

Pepeta is sold locally and produced for self-consumption.

CURRENT STATUS

Since it is not produced to be consumed as food but chewed as a snack, national agricultural policies do not support its production. It is not seen as a food that guarantees food security and is considered junk food by government agencies, so this culinary and agricultural tradition may disappear.

N. 39 TOGWA

CATEGORY

DISTILLED AND FERMENTED BEVERAGES

PRODUCTION AREA

RUVUMA, PWANI REGION

INGREDIENTS

FINGER MILLET (*ELEUSINE CORACANA*)

CORNMEAL

WATER

SPICES (OPTIONAL)

PREPARATION METHOD

TO MAKE THE *TOGWA*, MILLET IS SOAKED IN WATER FOR TWELVE HOURS. THEN IT IS RINSED AND TRANSFERRED TO A SHEET, USUALLY A PLASTIC ONE. THE SHEET IS COVERED AND LEFT UNDER THE SUN TO DRY FOR FIVE DAYS; ONCE DRIED, THE MILLET IS COARSELY GROUND UNTIL MALT IS OBTAINED. NEXT, ONE FILLS A LARGE POT OF WATER, ADDS THE CORNMEAL, WHILST STIRRING VIGOROUSLY; THE LIQUID CONTINUES TO HEAT UP TO AROUND 80°C, AFTER WHICH THE TEMPERATURE REDUCES TO 50°C AND THE MILLET MALT IS ADDED. TEMPERATURE CONTROL IS VITAL TO MAKING TOGWA SO THERE IS A CONSTANT FOCUS ON MOVING THE POT, AND TAKING IT OFF AND PUTTING IT ON THE FIRE. EVERYTHING IS LEFT TO COOL AND THEN THE TOGWA IS POURED INTO BOTTLES THAT ARE COVERED WITH SHEETS AND PLACED IN THE COOL AREAS OF THE HOUSE, TO KEEP THE DRINK COLD. SOMETIMES SPICES LIKE CARDAMOM OR GINGER ARE ADDED TO MAKE THE DRINK TASTIER.

Togwa is a traditional lactic acidic-fermented beverage made from cereal flour and malt. It is an indigenous Tanzanian brew of artisanal production.

Several variations of the drink exist across the Tanzanian territory. They vary in the main ingredients used in its preparation as well as in their ratio. In the southern part of Tanzania, togwa is made from maize flour and germinated finger millet (*Eleusine coracana*), though sorghum and cassava flours are used in other areas of the country.

Togwa is usually prepared at the household level, using artisanal methods and techniques that are embedded in family life and passed down through the generations.

It is a turbid, non-alcoholic drink, with a fairly sweet and slightly acid flavour. Since the fermentation is spontaneous and uncontrolled, its taste varies according to the specific environment and season in which the drink is prepared. Moreover, its texture varies according to its use: it is thicker when used as a weaning food but it is diluted, hence more fluid, when used as refreshment.

PRODUCT HISTORY

Traditionally, women have performed togwa preparation. Although the togwa is nicknamed "a drink for women", the men belonging to the Matengo community, in southern Tanzania near Lake Nysa, usually drink togwa as an energy drink (due to its high carbohydrate content) during difficult and tiring agricultural work. It is drunk in place of breakfast in the morning. Moreover, given its probiotic and nutritional values, it has been traditionally used as a weaning food.

Togwa is also served as a drink during important community ceremonies such as rituals, initiation rites, dances and weddings. It plays a very important role for the local communities not only as a food but also because it represents an economic income for women who often sell it on the street or in local markets.

In the rural villages of Tanzania, cereals such as maize and millet are some of the most common staple foods. Togwa, along with *mbege* and fermented porridge, is a clear example of the traditional gastronomic knowledge of the rural communities that tie together the need to provide different nutrients while differentiating the taste of the locally available ingredients.

CURRENT STATUS

The consumption of togwa is declining. The product is associated with low-income groups, and its popularity is being undermined by its poor shelf life. Although the drink was once popular, it is losing attraction to a younger generation that is more interested in the soft-drinks commonly found in urban settings. It remains popular with older generations.

NOTES

CHAPTER 4

STAPLES AND STARCHES

N. 40 AMASOMA
(VIBERE YAM)

Dioscorea bulbifera L.

CATEGORY

Roots and tubers

PRODUCTION AREA

Kilimanjaro and Meru Regions
Bukoba and Kagera Regions
Tukuyu and Rungwe Regions

SEASONALITY

SOW

Throughout the year

HARVEST

After the rainy season

SENSORY ANALYSIS

VISUAL

Fruits are 2.5 cm long. The potatoes (flattened bulbils) have a butterfly shape and are yellow inside. The outer skin can be grey, brown or purple.

TASTE AND CONSISTENCY

Tubers taste close to white potatoes when cooked, and they have a fibrous texture, more tender than yam.

EDIBLE PARTS AND COOKING TECHNIQUES

TUBER

boiled, roasted

Dioscorea bulbifera, the air potato or aerial yam, is a climbing vine that bears "tubers" (actually bulbils) along its stem, at the base of the leaves. It grows up to a height of about 10 m and produces yams only once a year. After the bulbils mature, the plant dies back and remains dormant in the ground until the next season, when it sprouts again. The tuberous root can last a year or more in the ground waiting for suitable environmental conditions to sprout.

Although some wild varieties of this plant can be poisonous, many varieties are cultivated or gathered from the wild for human consumption in Africa. The bulbils are the most-often consumed part of the plant. When the bulbils are ready, they can be picked like fruit.

Amasoma Vibere or *amasoma* is a variety of D. *bulbifera* that grows in the areas of the country that are also known as the banana growing regions, such as Kilimanjaro and Meru in northern Tanzania, Bukoba and Kagera in northwest Tanzania and Tukuyu and Rungwe in southern Tanzania. It is harvested after the rainy season, and can be kept for an entire year without spoiling.

CULINARY USES

The amasoma may be cooked with meat, beans, and maize or boiled and eaten with tea. The bulbil does not require peeling. It is often boiled with salt, and eaten with tea, usually as a snack. It can also be eaten after being roasted in the ashes of a fire and then peeled or made into porridge. It is more common for older people to consume amasoma, especially for breakfast. The bulbils are a good source of protein and minerals such as zinc and iron.

PRODUCT HISTORY

Amasoma has been used for many centuries as a famine food by many Tanzanian communities, including the Chagga, Meru, Nyakyusa, Haya and Nyambo.

Amasoma and other species of the Dioscorea genus are reported to be poisonous but if well processed the local people in places where they are found eat them as food, especially during famine. In the past, tubers of several of the toxic varieties of aerial yams were made edible through a process of detoxification, by pounding the tubers with lime or sand and then roasting or boiling them with ashes and eventually steeping the sliced pieces in running water.

This species is also known for its medicinal properties, as it is believed to help prevent high blood pressure. Bitter tubers are considered to help in the treatment of malaria and kidney disorders.

Amasoma is rarely found for sale on the market, but is cultivated in relatively low quantities for personal and family consumption.

CURRENT STATUS

Amasoma is disappearing in most gardens as farmers' transition to monocultures of other crops. Compared to the past, very few people still intercrop it in their banana plantations. Continuous clearing of natural forests and a lack of knowledge transfer from the elderly to the younger generations have contributed to reduced biodiversity on farms and to the disappearance of crops such as amasoma. The demand and consumption of amasoma has decreased among the younger generations that prefer cassava, potatoes, bread and other baked goods. Recently some local restaurants in Arusha have introduced locally grown indigenous ingredients such as amasoma.

N. 41 FIIYE
(LESSER YAM)

Dioscorea esculenta (Lour.) Burkill

CATEGORY

ROOTS AND TUBERS

PRODUCTION AREA

KILIMANJARO REGION
ARUSHA REGION
MBEYA REGION

SEASONALITY

SOW

AT THE BEGINNING OF THE RAINY SEASON

HARVEST

6-10 MONTHS AFTER PLANTING

SENSORY ANALYSIS

VISUAL

THE TUBERS OVAL, GROW UP TO 20 CM LONG AND 6 – 8 CM IN DIAMETER. THE FLESH IS YELLOW OR WHITE WHILE THE SKIN IS DARKER AND FIRM IN TEXTURE. THE AVERAGE TUBER WEIGHS FROM 250 G TO 1 KG, THOUGH LARGER ONES CAN WEIGH UP TO 3 KG. EACH PLANT CAN PRODUCE 5 – 20 TUBERS.

TASTE AND CONSISTENCY

SWEET, WITH A FLAVOUR SIMILAR TO SWEET POTATO OR CHESTNUTS.

EDIBLE PARTS AND COOKING TECHNIQUES

ROOT

BOILED, ROASTED, STEWED

Fiiye is a local species of yam grown mostly in the Kilimanjaro region. It is a perennial climbing plant that grows well in association with plants such as coffee, banana trees and other fruit trees that act as supports.

The edible part is the root. The roots grow downwards, and the sprout grows upwards, leaving the surface free, which is why it is possible to grow other vegetables around them.

Farmers sow fiiye by cutting the tuber into four pieces. Before placing each section in the soil, they disinfected them by rubbing the pieces with ash and herbs. After two weeks, they

fertilise with some compost mixture containing banana peels and other vegetable waste. After 6 to 10 months, the roots can be extracted, by digging carefully and deeply (about half a metre) around the plant, to avoid damaging it.

CULINARY USES

The roots can be cooked exactly like potatoes. There are various traditional techniques of preparation. The most widespread involves digging a hole in the ground, burning some small branches and then placing the tubers (with skin) on the embers, and covering them with another layer of embers. Every so often, they are turned so they roast evenly on all sides. A small sharp stick is inserted into the pulp to check if they are cooked. Once the stick comes out completely clean, the fiiye is ready. At this point, the surface is gently rubbed with a kitchen knife, to eliminate the brown skin and get to the white pulp. Then it is cut into slices and served alone or with fermented milk, or with a drink made from bananas, corn, or millet. It is served on banana leaves (which are first smoked on the fire, so they become as hard as a sheet of aluminium).

Another recipe involves boiling the fiiye in an earthenware casserole. This recipe also leaves the skin on. Once cooked, the peel is removed, and the roots are served with yoghurt, milk, meat or fish stew.

Fiiye is also an ingredient of a traditional dish made with peeled roots, cut into cubes and cooked with tomatoes, onions, carrots and other vegetables.

PRODUCT HISTORY

Along with the purple yam (*Dioscorea alata*), fiiye have been introduced into Africa from South-East Asia, especially in the Eastern coast of the continent.

The tuber is cultivated by rural communities in Tanzania, such as the Chagga people, living on the Kilimanjaro and Mount Meru. In the past, fiiye was one of the most important crops in traditional home gardens, where food and cash crops were cultivated in the same plot of land along with several multi-purpose trees and shrubs, used as a source of timber, building materials, and animal fodder.

Fiiye was highly appreciated by the elders who preferred the flavour of this tuber to that of potatoes and other yam varieties. Moreover, it represented a good source of protein and Vitamin B and minerals, especially potassium.

CURRENT STATUS

In the past decades, the cultivation, consumption and trade of fiiye have all dramatically decreased. Due to the low-rate of growth, low yields and its perishability, many farmers have replaced fiiye with other tubers and roots. Small amounts of this crop are produced for home consumption and traded only within the community.

N. 42 INUMBU
(LIVINGSTONE POTATO)

Plectranthus esculentus N.E.Br.

CATEGORY

ROOTS AND TUBERS

PRODUCTION AREA

KIGORA VILLAGE,
MOROGORO REGION

SEASONALITY

SOW

SEPTEMBER – FEBRUARY
(RAINY SEASON)

HARVEST

THE TUBERS ARE READY TO HARVEST
ABOUT 3-6 MONTHS AFTER PLANTING.

SENSORY ANALYSIS

VISUAL

THE PLANT PRODUCES 20–30 FINGER-LIKE TUBERS THAT ARE VERY LIGHT IN COLOUR. THE SIZE OF THE ROOTS IS SLIGHTLY SMALLER THAN THOSE OF SWEET POTATOES, APPROXIMATELY ABOUT THE SIZE OF A FINGER.

TASTE AND CONSISTENCY

FLESHY, MILD, WATERY TASTE. SIMILAR TO THE TASTE OF SWEET POTATOES.

EDIBLE PARTS AND COOKING TECHNIQUES

ROOT

RAW, BOILED

WAYS OF PRESERVING

DRYING

Inumbu or the Livingstone potato is a perennial plant, indigenous to the southern and western part of Tanzania and considered one of the lost crops of Africa. Also known as the kaffir potato, inumbu is a member of the Lamiaceae family.

It fairs well in both dry and moist conditions and is commonly found in rocky savannah bushland or woodland. Besides growing wild, farmers grow inumbu in home gardens. Being a perennial plant, if there is enough water, it can be planted at any time of the year. But if water is scarce, this operation takes place only during the rainy seasons. It takes 3 to 6 months from planting to harvesting, depending on the variety.

The harvested inumbu tubers are highly perishable. To reduce post-harvest loss, tubers are generally kept in cool, dark places or underground pits.

CULINARY USES

The roots of inumbu are usually eaten raw, boiled, fried or roasted. Its roots are a delicacy in stews, soups and many other dishes. People eat inumbu as a substitute for sweet potato. The tubers can also be dried and stored for later use.

PRODUCT HISTORY

The Livingstone potato is one of the earliest African crops to be domesticated and has a long legacy in the agricultural and food heritage of many rural and indigenous communities in the African continent. Different African pastoral communities traditionally ate inumbu roots raw. For some Tanzanian communities, it still has an important role in guaranteeing the food security of local people, and it also brings economic benefits through the selling of the surplus.

Inumbu plays a significant role in the food systems of the Waha ethnic group of the north-western part of mainland Tanzania, near Lake Tanganyika. Traditionally, the Waha use this potato as a source of drinking water. When the Waha people go out to work in the fields, they take these tubers with them to quench their thirst.

Inumbu is one of the most nutritious tubers of all African tuber vegetables and contains a high level of starch (80%). In addition to its high starch content, it contains 13% essential amino acids as well as an additional level of other important vitamins and minerals, such as calcium, iron and Vitamin A.

Despite its use at the domestic level, inumbu are seldom sold in local markets. In Kigora, people, especially women, sell boiled tubers as street food.

CURRENT STATUS

While the species was commonly cultivated in the past, there is a great decline in the production of inumbu, as many farmers have replaced it with other domesticated root crops. Some decades ago, it was ubiquitous and was even sold in the markets of Kigoma, but now this tuber is hard to find. Currently, this species is cultivated as a minor root crop by very few farmers and is mainly used for home consumption, in small amounts in remote areas.

N. 43 NDIZI IFANAIYA
(IFANAIYA BANANA)

Musa acuminata Colla

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

KILIMANJARO REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

ALL YEAR ROUND, ESPECIALLY DURING THE RAINY SEASON.

SENSORY ANALYSIS

VISUAL

FRUITS HAVE A SLIGHTLY CURVED SHAPE. THE SKIN OF RIPE FRUITS IS YELLOW, WHILE THE PULP IS CREAMISH WITH BROWN STREAKS. EACH BUNCH OF BANANAS HAS AROUND 25 FRUIT.

TASTE AND CONSISTENCY

RIPE FRUIT IS MILD IN TASTE WITH A FLOURY TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

BEVERAGE

WAYS OF PRESERVING

FERMENTATION

Ifanaiya is an indigenous banana cultivar from the Kilimanjaro Region. It is known to local farmers as very resistant to poor soil conditions and to an arid climate. Like other bananas in the Kilimanjaro region, it is cultivated by intercropping.

In Machame village, Chagga farmers normally intercrop bananas with cash crops such as cassava, coffee, sunflowers and even traditional food crops such as climbing yams (*Dioscorea spp.*). In the home gardens, a wide range of banana varieties are found, with around 25 different cultivars in the same land unit.

Banana trees cover an important role in traditional agricultural systems, providing shade for other crops. Moreover, leaves and other parts of the plant are used as animal fodder.

CULINARY USES

In the Kilimanjaro area, the ifanaiya banana is mostly used in beer making. To prepare the drink, brewers remove the skin of the ripe fruit, then they boil the remaining fruit with water, which is then decanted. Then the juice is taken and the remains discarded. The juice is put in metal or plastic containers, finger millet (*Eleusine coracana*) is added, and the mixture left to ferment for one day, to form an alcoholic drink called *mbege*. The resulting drink is later filtered and ready to drink. Traditionally, women take care of the preparation of mbege and other traditional brews.

Ifayana can also be an ingredient of *mtore*, a traditional soup of the Kilimanjaro area made by boiling unripe bananas and meat until the mixture is soft enough to be mashed into a runny paste, which is eaten as porridge or soup. People usually eat it at breakfast time.

PRODUCT HISTORY

Banana trees have traditionally played an important role in the livelihoods and culture of the Chagga communities.

The ifanaiya banana has played an important role in traditional ceremonies, in particular for the preparation of ritual brews such mbege. Mbege has been used in different Chagga celebrations, especially during dowry ceremonies and weddings. In the olden days, many rituals were carried out during weddings and dowry ceremonies, some of which are not practised anymore. One example is *tafura*: a method a man would use when he couldn't afford a dowry, to get a wife. In tafura, the man invite a woman to his home, but when the time came for her to return to her home, he would not permit her to leave. The following morning, he would have his friends send mbege to her family, to announce that she was now his wife.

In Machame village, as well as in other rural villages on the slopes of Mount Kilimanjaro, banana plantations have played a pivotal role in the subsistence and economy of local communities. Besides being at the centre of the diet and subsistence economy, banana trees provided materials for buildings and furniture. For instance, banana fronds have been used for the construction of the rooves of traditional huts.

CURRENT STATUS

Nowadays, agrobiodiversity in Chagga farming systems has decreased dramatically due to changes in the broader regional food system. Many farmers have shifted from polycultural systems to monoculture and are replacing ifanaiya with other common varieties, such as *ndizi mshare* and *ndizi bukoba*. These varieties have better yields and are more suitable for the market.

N. 44 NDIZI KISUKARI
(KISUKARI SWEET BANANA)

Musa spp.

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

KILIMANJARO REGION
MOROGORO REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

ALL YEAR ROUND, ESPECIALLY DURING THE RAINY SEASON.

SENSORY ANALYSIS

VISUAL

THIS LOCAL VARIETY HAS A GREEN SKIN THAT, WHEN THE FRUIT IS FULLY RIPE, BECOMES BRIGHT YELLOW. IT IS USUALLY 15 CM LONG, HENCE SMALLER THAN OTHER LOCAL BANANA VARIETIES.

TASTE AND CONSISTENCY

RIPE FRUIT IS SWEET AND SUGARY.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

RAW, DESSERTS

The *Ndizi Kisukari* is a local banana variety grown mainly near the slopes of Mount Kilimanjaro and in Morogoro region.

In the Kilimanjaro region, the banana trees are grown in the uplands in the so-called Chagga home gardens, usually intercropped with trees and shrubs. The plant has large leaves that provide shade to the other crops such as coffee. Each farmer owns on average 2 acres of banana plantations, that are rain-watered, and cultivated with simple tools and the involvement of the members of the family.

In the Morogoro region, local farmers use the name "kisukari" for at least 8 different sweet banana cultivars. Dessert bananas, such as ndizi kisukari, are harvested for sale at the "full three-quarters" stage of maturity. Afterwards, fruits are immediately put in a special ripening pit where they are smoked, before being transported to the urban markets. This practice increases the shelf life of the product and reduces its perishability.

CULINARY USES

The kisukari is prized for its delicate taste: the word "sukari" in Swahili means sugar and this cultivar is considered one of the best dessert bananas by many Tanzanians. It is often eaten fresh and not turned into derivative products. Given its high vitamin content, especially Vitamin A, B, and C along with calcium and phosphorus, it is offered as a snack for children.

Occasionally, this variety is cooked (boiled or roasted) or even used as an ingredient for the preparation of traditional fermented beverages.

PRODUCT HISTORY

The Kilimanjaro area has dense banana forests with a scattered upper tree layer, the so-called Chagga home gardens, or banana groves, known in the Chagga language as *mndà*. Wachagga or Chagga people settled in Kilimanjaro area in remote times, at the foot of Mount Kibo, one of the three volcanic cones of Kilimanjaro.

Banana trees have always played a pivotal role in the traditional Chagga agro-ecosystem, providing food, fodder, building materials, and manure. For instance, after bananas harvesting, the leftover parts of the plant are used to feed livestock. The dry leaves of the plant are used as bedding material in the animal barn as a way to keep warm, especially during the cold season. The cow dung mixed with the used beddings is then spread on the banana farm as manure.

The kisukari variety is tied to the Chagga municipality: its production is one of the main sources of income for local farmers, who gather it along with other banana varieties and crops to then sell in local markets or on roads both in urban villages and in the neighbouring towns.

CURRENT STATUS

Due to climate change, this variety has become less and less productive and requires more and more care. For this reason, fewer families grow this variety now than in the past.

At the same time, due to increased rural-urban migrations, people have experienced changes in their dietary patterns, shifting from a diet based on banana as the main staple food, to one based on cereals and processed foods. This has, in turn, led to the spread of obesity and non-communicable diseases, especially among younger people.

N. 45 NDIZI KITARASA
(KITARASA BANANA)

Musa acuminata Colla

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

ROMBO, MOSHI AND HAI DISTRICTS, KILIMANJARO REGION
ARUMERU DISTRICT, ARUSHA REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

ALL YEAR ROUND, ESPECIALLY DURING THE RAINY SEASON. THE FIRST BUNCH CAN BE HARVESTED 18 MONTHS AFTER PLANTING THE BANANA TREE.

SENSORY ANALYSIS

VISUAL

THE SKIN OF THIS BANANA IS GREEN AND THE PULP OF THE UNRIPE FRUIT IS ORANGE-YELLOW. KITARASA DIFFERS FROM OTHER TYPES OF BANANAS AS IT HAS AN ORANGE SAP WHEN PEELED, COMPARED TO THE WHITE SAP OBTAINED FROM OTHER BANANA VARIETIES. ONE TREE CAN BEAR 4 – 7 BUNCHES, WHICH WEIGH 6 – 17 KG EACH, DEPENDING ON THE SIZE THE BANANAS WHEN HARVESTED.

TASTE AND CONSISTENCY

VERY SOFT WITH A MILD FLAVOUR.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

BOILED, STEWED, ROASTED

WAYS OF PRESERVING

DRYING, FERMENTING

Kitarasa is a variety of green banana, locally grown by the Chagga communities living in some municipalities of Kilimanjaro and Arusha regions.

Kitarasa bananas are cultivated by small producers on small plots of land that are normally between a quarter of an acre to one acre in size. Like other green banana varieties, kitarasa banana trees are grown in agro-forestry systems along with other food crops such as coffee, tubers and vegetables.

Suckers (small shoots growing from the base of the tree) are used as propagating materials. This plant produces two to three suckers per year compared to other banana varieties that can yield five to eight suckers per year.

CULINARY USES

Kitarasa is usually cooked, mashed and served as a side dish. It can also be roasted or used as an ingredient in soups.

During German colonisation, according to local knowledge, the kitarasa was consumed for nutritional purposes when other foods were scarce, due to its high nutritional content and health giving qualities: it was prepared as a porridge, ugali or used in the preparation of *mtori*, a traditional soup made with unripe bananas and meat. Elderly people ate it in soup, especially during rainy seasons, to keep them warm.

Chagga people have traditionally used this banana for the preparation of *mbege* a traditional fermented drink served during special occasions such as ceremonies.

PRODUCT HISTORY

Kitarasa is believed to have been first cultivated by the ancestors of Chagga community, on the lower slopes of Mount Kilimanjaro and later adopted by the Wameru communities on the lower slopes of Meru Mountain.

Traditionally, it was considered vital for breastfeeding mothers and an efficient remedy for stomach ache. At that time, it was smoke-dried and then pressed to extract a powder. The powder was used to treat cattle, in particular, to relieve the trauma of calving.

The traditional value of this variety lives in an old Swahili proverb: "*Damu ni damu si kitarasa*" (Blood is blood, not red banana sap), meaning, "Kinship is stronger than friendship".

Banana trading takes places both in local villages and in urban areas of the region, directly involving the farmers or middlemen who sell the produce at markets in town. Bananas, which are sold outside the district, are mainly used for food while the ones sold locally are both used for food and for the production of mbege. The ones sold for this purpose are especially the *mrarao* and kitarasa.

Recently, the production of dried powder or flour made from kitarasa and other green bananas has been promoted by international organisations. They can be used in the preparation of soups, cakes, doughnuts and porridges, as well as for medicinal purposes.

CURRENT STATUS

With the arrival of European pharmaceuticals and the introduction of modern medicinal practices, the kitarasa banana has lost its popularity. It is no longer used as a treatment for trauma and its cultivation has been gradually abandoned.

In 2012, a group of local farmers in the Dorkia garden situated in Moshi (north Tanzania) started cultivating this variety along with other heirloom vegetables using sustainable methods, natural pesticides and fertilisers. Following their examples, other local producers have reintroduced kitarasa banana, thus promoting the renaissance of this crop.

N. 46 NDIZI MBIRE
(MBIRE BANANA)

Musa acuminata Colla

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

BUKOBA DISTRICT, KAGERA REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

JULY – AUGUST (MAIN HARVEST) AND NOVEMBER - JANUARY

SENSORY ANALYSIS

VISUAL

FRUIT RESEMBLES THAT OF THE *MATOKE* BANANA. THE PULP IS WHITE AND HAS STICKY BROWN EXCRETIONS. WHEN COOKED, IT TURNS YELLOW. THE BUNCHES TYPICALLY WEIGH BETWEEN 20 TO 25 KG.

TASTE AND CONSISTENCY

BITTER, SOUR TASTE WHEN COOKED.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

BOILED

WAYS OF PRESERVING

FERMENTATION

Ndizi mbire is a local banana cultivar from the Kagera region. There are three main types of banana in the area, namely *kitooke* (cooking banana), *mbire* (brewing banana), and *nkonjwa* (roasting banana).

The Haya people are the major cultivators of the mbire banana. They grow mixed-crop, home gardens that are made up of banana, both for food and sale, and coffee as the main cash crop. This type of co-planted garden is grown at high altitudes in the so-called *kibanja*. In addition to bananas and coffee, seasonal crops like maize, beans, cassava and a variety of other fruit and vegetables are also planted in home gardens.

Kibanja gardens are zero-tillage and always covered in organic material produced from farm operations or processing. Management of the crops is typically a male responsibility.

Haya farmers hold an intimate understanding of their land and the banana species, and they pass on this knowledge through generational family gardening.

CULINARY USES

Mbire possesses the best brewing capabilities of the three banana types found in the Kagera region. Ripened mbire bananas produce a very clear juice when mixed with a type of grass called *omushojo* (*Eracrostis spp.*). This combination is normally used by the Haya to make a traditional beer called *rubisi*. To prepare the drink, brewers mix the fresh banana juice, called *mulamba*, with germinated millet flour and let the mixture ferment, after covering the container with banana leaves. Women are often in charge of cooking and brewing. Rubisi has a short shelf life and it spoils after 4-5 days.

PRODUCT HISTORY

The Haya people are the main cultivators and brewers of the mbire banana. The Haya have inhabited the Kagera region in north-western Kenya since the expansion of the Bantu, and are believed to be some of the earliest to settle in the area.

The Haya tribe have cultivated and used the mbire banana long before the Independence of Tanzania. They used it as a gift and for the preparation of banana brew. The Haya people greatly respect rubisi beer and it is usually used in traditional ceremonies and rituals, such as weddings and funerals.

Bananas are important foods and cash crops for many people in the Bukoba District. The mbire banana is consumed by households, sold, traded, or gifted. In recent years, female-led households have capitalised on the growing demand for banana beer and often brew it to sell it to their neighbours. Unlike in other regions, in Kagera men manage beer trading too.

CURRENT STATUS

Although the mbire banana is disease and drought-resistant, it is at high risk of disappearing. This is primarily due to the introduction of new banana varieties, such as Cavendish bananas, and the onslaught of industrialisation and urbanisation. There is a great need to protect this particular type of banana because it holds very important traditional and cultural values for the Haya. However, the production of rubisi has been discouraged by the national government because the drink is illegally distilled to produce *gongo*, which can be harmful to health.

N. 47 NDIZI NDUYA
(NDUYA BANANA)

Musa spp.

CATEGORY

Fruit and nuts

PRODUCTION AREA

Machame village, Kilimanjaro Region
Meru District, Arusha Region

SEASONALITY

SOW

Throughout the year

HARVEST

Mainly the rainy season
(March – May / November)

SENSORY ANALYSIS

VISUAL

The Nduya variety does not differ from other banana species except for the shorter, larger shoots and fruits that are smaller compared to other Tanzanian varieties. Fruit ranges in size from 4 cm to 9 cm. The fingers are normally smaller, pointed and have straighter leaves.

TASTE AND CONSISTENCY

The bananas have a bitter taste similar to that of *Ng'ombe* banana.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

boiled, raw

WAYS OF PRESERVING

fermentation

Nduya is a local banana variety, spread in the northern area of Tanzania. It is a traditional crop in Machame and other rural villages in the Kilimanjaro region.

People belonging to the Chagga ethnic group are well known in the area for the cultivation of this banana. The banana tree is one of the main species found in the so-called *vihamba* or *kihamba*, a particular agro-forestry system with a multi-layered vegetation structure, similar to a tropical montane forest.

Nduya, like other bananas in the Kilimanjaro region, is cultivated by intercropping. It is intercropped with cassava, coffee, sunflowers and different yam species, such as *Amasoma*

vibere, a type of climbing yam. Cow manure is used in its cultivation to fertilise the soil. The rainy and dry seasons dictate the banana yield. High production is apparent in wet seasons and far less in drier seasons. The nduja banana is well adapted to local environmental conditions, and it responds well to poor soils and dry climates.

CULINARY USES

The fruit is the only part of the plant eaten. It is usually consumed raw or fermented into an alcoholic beverage. Nduya, along with *mafanaia*, *ilalyi* and *finangwa*, is one of the so-called "brewing banana" cultivars used in the Kilimanjaro region. It has been traditionally used by local communities to make *mbege*. This fermented banana drink is one of the pillars of the Chagga culture and is a key part of their rich and stratified historical heritage. It was once consumed in great quantity. Mbege was traditionally prepared by Chagga people to celebrate social moments of life.

PRODUCT HISTORY

Humans have inhabited the slopes of Mt. Kilimanjaro for the last 2000 years. In particular, the livelihood of the Chagga people is the result of long coevolution between the community and the local environment. The practices linked to the traditional agroforestry system are a clear example of the sustainable and reciprocal relationships that Chagga farmers have with the naturally available resources. Home gardens are developed on four vegetation layers. Banana trees grow under the shade of trees, and coffee and several vegetables are cultivated under banana trees. This multi-layered system maximises the use of limited land while increasing the biodiversity of the area.

Nduya banana has been used in ceremonies, such as when celebrating the birth of a child or a christening. It is specifically consumed and gifted during dowry ceremonies and enjoyed at traditional Chagga weddings in the region.

CURRENT STATUS

While in the upper zones home gardens are still present, its distribution has dramatically decreased in the lower zone due to changes in land use. Nduya used to be cultivated and sold much more frequently that is today, but it does not fare well in the markets due to the size of its fingers. The scarce commercial fortune of this variety has led to a sharp decrease in the cultivation area.

N. 48 NDIZI NG'OMBE
(NG'OMBE BANANA)

Musa acuminata Colla

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

SANYA JUU, MACHAME, KIBOSHO AND ROMBO, KILIMANJARO REGION
ARUMERU DISTRICT, ARUSHA REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

RAINY SEASON

SENSORY ANALYSIS

VISUAL

THE NG'OMBE BANANA IS GREEN WHEN IT IS UNRIPE AND YELLOW WHEN IT IS RIPE. EACH BANANA PLANT PRODUCES BUNCHES WITH AROUND 6 TO 12 BANANAS.

TASTE AND CONSISTENCY

THE TASTE IS SLIGHTLY BITTER WHEN UNRIPE. WHEN COOKED, IT HAS A HARD TEXTURE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT

BOILED, STEWED

WAYS OF PRESERVING

FERMENTATION

Ndizi ng'ombe is a traditional cultivar of "highlands banana", grown in the northern part of Tanzania. It is a so-called "brewing banana", and the uniqueness of this variety lies in its use for the preparation of *mbege*, a fermented beverage produced with a mixture of fermented finger millet and banana.

Bananas have been in Tanzania for many generations and have evolved a large number of varieties. Growing bananas requires a long-practised method of cultivation. The offshoot, called a corm, of a healthy mature banana is cut off and planted on its own. Predominantly local technologies are used to plant and harvest the bananas. Most farmers in the area have no more than 4 acres and their plots are rain-fed.

Ndizi ng'ombe requires plenty of rain and fertile soil. The rainy and dry season dictate the banana yield. High production is apparent in wet seasons and far less in drier seasons. The production of each plant depends directly on the age and health of the plant, as well as the amount of rain the area has received that season.

CULINARY USES

Since the ng'ombe banana is relatively bitter compared to other types, they are used for the production of traditional alcoholic beverages, such as mbege, and not for direct consumption of the fruit.

Ng'ombe bananas are also used as an ingredient in meat and vegetable recipes. Moreover, ng'ombe bananas are the main ingredient of *loshoro*, a traditional drink made by boiling together maize, milk (or sour milk) and different starches, including the banana. The drink is served in wooden bowls or calabashes. Loshoro can be stored for 2-3 days without spoilage.

PRODUCT HISTORY

Loshoro and mbege are part of the traditional food culture of several different communities living in the Arusha region, including the Meru and Arusha people. Mbege was traditionally used to pay part of a dowry and served at weddings and funeral ceremonies among the Chagga communities in the Kilimanjaro Region, and Meru communities in the Arumeru District in the Arusha region. Banana leaves of this and other varieties have been traditionally used as a source of shade, to provide clean surfaces for eating, and also for fibrous material to produce goods.

Ng'ombe bananas are still produced in small quantities at low altitudes on the slope of Kilimanjaro, especially in the villages of Sanya Juu, Machame, Kibosho and Rombo and at low altitudes on Mount Meru by the Meru communities. This variety is usually sold to local markets or grown for personal use. Homemade mbege is also sold either from homesteads or to local pubs.

CURRENT STATUS

Since the ng'ombe bananas are used mainly to prepare mbege, and as this brew is losing importance, they are at risk of disappearing from the local foodscape. People prefer commercial alcoholic beverages rather than traditional ones. At the same time, farmers are replacing this variety with commercial banana varieties. The repeated use of the same soil for bananas has left many regions depleted of rich micronutrients. This is making it more difficult for farmers to have a stable production of this crop.

N. 49 NDIZI NKONJWA
(NKONJWA BANANA)

Musa acuminata Colla

CATEGORY

FRUIT AND NUTS

PRODUCTION AREA

BUKOBA,
KAGERA REGION

SEASONALITY

SOW

THROUGHOUT THE YEAR

HARVEST

LONG RAINY SEASON
(THE PLANT IS MOST PRODUCTIVE
FROM MARCH TO MAY)

SENSORY ANALYSIS

VISUAL

THIS VARIETY HAS A LIGHT GREEN PEEL THAT IS QUITE THICK AND TURNS YELLOW WHEN THE FRUIT IS RIPE. THE PLANT HAS A FEW BIG LEAVES AND EACH BUNCH CONSISTS OF BETWEEN 10 AND 12 FRUIT. THE BANANAS ON THIS PLANT ARE SLIGHTLY LARGER THAN THOSE FOUND ON OTHER VARIETIES.

TASTE AND CONSISTENCY

SOMEHOW BITTER, ESPECIALLY WHEN UNRIPE.

EDIBLE PARTS AND COOKING TECHNIQUES

FRUIT (GREEN AND RIPE)

BOILED, ROASTED

WAYS OF PRESERVING

FERMENTATION

Nkonjwa is a traditional banana variety that is found in the Kagera region, specifically in the village Bukoba.

This banana tree is always grown together with other banana varieties and intercropped with other produce, cultivated for both home consumption and the market.

The Haya, who are the most important ethnic group in the Kagera region, have developed land-intensive permanent husbandry with accumulated local knowledge and with several kinds of indigenous agricultural tools. The management of perennial crops, including banana

plants, is the responsibility of men. Nkonjwa basically needs less labour input than other starch crops overall. Because it is hardy and thrives in the region, it can be grown without the use of industrial fertilisers, which is not the case with other, more commercial varieties.

CULINARY USES

The fruit is usually enjoyed ripe. On occasion, the bitter green version is eaten as well but cooked first. The fruit, when ripe, is usually boiled or roasted and eaten separately from the main dish. Among the Haya people, green nkonjwa bananas are considered the best roasting banana cultivar. They are roasted over a low flame on the stove, cooked using hot cinders or directly on the grill.

When ripe, nkonjwa bananas are often eaten raw as a snacking food. The flavour of this banana pairs well with a traditional banana and sorghum beer called *rubisi*.

PRODUCT HISTORY

Linguistic evidence suggests that the banana was introduced to the area between AD 800 and 1300. The introduction of the banana is probably linked to the introduction of cattle in the area, which provided manure that helped maintain the soil fertility necessary for banana production.

Even now, the Haya are traditionally known as banana growers due to large numbers of bananas they grow. Haya farming is characterised by management of banana-based home gardens, known locally as *kibanja*.

Nkonjwa bananas were an essential part of the Haya community's diet and had a specific cultural significance. The Haya people traditionally used bananas in the production of alcoholic beverages which were consumed at special cultural celebrations such as weddings and funerals. Nkonjwa was often offered to guests, heads of families and local community leaders as a snack.

CURRENT STATUS

After independence, several changes occurred in the livelihoods of the Haya people due to the growth in population. The ways people began to use the land changed. Moreover, the number of cattle per family decreased because people started to sell them to acquire more land. Now that many households have sold their cattle, individual accessibility to cattle manure affects the agricultural strategies of each household. On the other hand, the focus on commercial production has pushed local farmers to focus on mainstream cultivars and abandon the local ones. Due to these complex changes, nkonjwa is rapidly becoming extinct, and there are very few families' left that grow them.

N. 50 NJUGU MAWE
(NSHORO BAMBARA NUTS)

Vigna subterranea (L.) Verdc.

CATEGORY

Legumes

PRODUCTION AREA

Arusha District, Arusha Region
Kagera Region
Mtwara Region

SEASONALITY

SOW

August - September

HARVEST

December-January
(5-6 months after sowing)

SENSORY ANALYSIS

VISUAL

The pods are approximately 1.5 cm long, round or slightly oval shaped, and may be wrinkled. Each pod contains one to two seeds, that can be black, dark brown, red, white, cream, or a combination of these.

TASTE AND CONSISTENCY

Seeds have a strong bean flavour and a crunchy texture even when cooked.

EDIBLE PARTS AND COOKING TECHNIQUES

SEEDS, LEAVES

raw, boiled, fried, stewed

WAYS OF PRESERVING

drying

Njugu mawe, known in English as Bambara groundnut, is one of the earliest food crops used by most agriculturalists in East Africa and an important food for the Haya community.

Haya farmers grow the crops in the *musiri* plots (crop fields based on the grass fallow system) with other leguminous species and roots such as the groundnut, cassava and sweet potato. Chemical fertilisers need not be applied to areas where this legume is cultivated because the crop fixes nitrogen.

Harvesting is usually done by uprooting or digging out the entire plant and picking the individual pods, which grow just under the soil surface. The pods are often sun-dried and

then threshed and winnowed to obtain the seeds. Women manage the land cultivated with this crop, are responsible for passing the seeds down through the generations, and storing the dried beans.

Besides its use for human consumption, seeds and green parts (e.g. leaves and leafy stems) are used as fodder for livestock like pigs, and chickens.

CULINARY USES

Njugu mawe seeds can be eaten fresh or cooked while still unripe. At maturity, they become very hard and require boiling before any further preparation is possible. They can be cooked together with other foods like maize and dried sweet potato and used as a sauce for main dishes. They are normally cooked or eaten raw when vegetables are in short supply. The seeds can also be dried, pounded to remove the seed coat, winnowed and boiled until they are cooked, then stirred until smooth and served with rice or *ugali*. Leaves can be boiled and served as relish dishes or even added to soups, though it is more common to find the seeds used.

PRODUCT HISTORY

The crop is a popular traditional food among the Haya people, especially in the Kagera region. They consider it a delicious food that should be present during every meal. Many taboos and beliefs exist around njugu mawe production and consumption. Haya farmers see this legume as a crop for women and children. Moreover, they believe that a woman on her period walking in a plot of njugu mawe would dry up the plants hence destroying the entire harvest. On the other hand, it is a taboo to plant this legume too early as it would delay the rain and affect the agricultural production of farmers in villages.

In Kagera Region, there is no formal market for bambara groundnuts. The crop is grown by local people, mostly for home consumption, while the surplus may be sold locally to neighbours, friends, or relatives as well in informal markets along the roads. While women are involved in cultivation, men manage the trading of njugu mawe. According to local farmers, seed colour is an important factor in the preference of the customers. For dry seeds, there is a clear preference for the cream colour ones.

CURRENT STATUS

Njugu mawe is at risk for several reasons: it is difficult to harvest, cooking the dried seed takes a long time compared to other nuts (thereby requiring more fuel and water to process), and it is difficult to mill due to its fibrous shell. Furthermore, it is usually given less value and priority in land allocation because women grow it. In the Kagera region land shortage, the outbreak of pests and diseases, the poor opinion younger farmers hold of traditional crops, and the lack of a ready market are some of the factors that are negatively affecting the production of njugu mawe in this area.

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UNIVERSITY OF GASTRONOMIC SCIENCES

The University of Gastronomic Sciences, founded in 2004 by the international non-profit association Slow Food in cooperation with the Italian regions of Piedmont and Emilia-Romagna, is a ministerially recognised, private, non-profit institution.

Its goal is to create an international research and education centre for those working on renewing farming methods, protecting biodiversity, and building an organic relationship between gastronomy and agricultural science.

The university aims to contribute at a global level to the development and strengthening of food systems that can:

- improve the spiritual and material wellbeing and health of all forms of life on Earth.
- celebrate and protect biological diversity and all linguistic, cultural and religious differences.
- improve conditions for food production, processing, distribution and consumption.
- ensure environmental and social sustainability and full food sovereignty.
- promote ethical, social and political responsibility at every level.

The vision of the University of Pollenzo is that gastronomic sciences will promote a complex, systemic and inclusive model of knowledge. It aims to create a model of relationships and coevolution, of involvement and parity of value. Gastronomy is not just a nutritional necessity but also desire and pleasure; it simultaneously studies and comprises technical abilities, know-how, invention and the creative imagination. In gastronomic sciences, knowledge is both science and culture at the same time.

The distinctiveness of the University's programs attracts students from dozens of different countries, who are all interested in an original educational project that combines study and practice, books and life testimonies, science, management, craftsmanship, and traditional knowledge. These programs are complemented by study trip experiences that are designed to offer direct contact with producers and companies in the agri-food industry, as well as first-hand experience of various regions and their cultural traditions around the globe.

To date, more than 3,000 students have studied or are studying at UNISG.

The University is supported by over 130 companies in the agri-food sector, as well as institutions that support research activities and actively participate in the life of the University. These companies and institutions make up the Association of Friends and Strategic Partners Club of the University of Gastronomic Sciences.

The methodological and didactic approach of the University provides students with a holistic view of current and past food production systems, and allows them to learn how to develop models and alternative scenarios for the food systems of the future.

The University creates gastronomes, new professionals with knowledge and expertise in many food-related fields. Gastronomes work to develop methods of food production, distribution, and consumption, who will create a more sustainable future for the planet.

The University's programs offer a comprehensive perspective on food, from cultural, social, economic, ecological, communications, and marketing points of view. Currently, the university offers an Undergraduate degree, Graduate degree in Food Innovation & Management, Master programs, and PhD Program.

THE ARK OF TASTE

The Ark of Taste is an online catalogue of foods at risk of disappearing that are a part of the cultures and traditions of the entire world.

The Ark was created to point out the existence of these products, draw attention to the risk of their extinction, and invite everyone to take action to help protect them by seeking them out, buying and consuming them, telling their story, supporting their producers, and, in some cases (such as the case of endangered wild species at risk of extinction), promoting their conservation and reproduction.

The overall objective is not to create a seed bank, a collection of genetic material, or museum to exhibit traditional knowledge, but to rediscover and give value to these resources in order to support local economies.

In addition to plant and animal species, processed products board the Ark because, together with plant and animal biodiversity, cheeses, cured meats, breads, and sweets are also disappearing. These products are expressions of farmers' and artisans' knowledge that exists not in written recipes, but as complex and rich skills and practices passed down through generations.

WHAT ARE THE CRITERIA FOR SELECTING A PRODUCT?

1. *Products can be domestic species (local plant varieties and animal breeds), wild species (only if related to techniques for collecting, processing or traditional uses), or processed products.*

2. *Products must be of particular sensory quality, as defined by local traditions and uses:* Chemical or physical analyses are not sufficient to judge the quality of a product, but nor is tasting.

   The origin of the product must be understood and communities must be consulted. Ultimately, it is fundamental to consider the palate of the community from which a product originates. A European product could be difficult to understand and appreciate for an African taster, just as an Asian product could be difficult to decipher and appreciate for a European.

3. *Products must be connected to a territory and to the memory, identity, and traditional local knowledge of a community:* The products that interest us are strongly linked to their territory, not just in terms of climate and environment, but also in a cultural, historical, and physical context.

4. *Products must be produced in limited quantities:* The Ark of Taste is a catalogue of products, not producers. Therefore, it is not necessary to have an exact figure of the quantity produced (data which is, however, essential for establishing a Presidium), but it is important to at

least identify an order of magnitude, to establish if we are dealing with an artisanal or an industrial product.

5. *Products must be at risk of extinction,* whether real (i.e. imminent) or potential (i.e. when the local social and environmental situations are such that a reduction in the quantity of the product or the number of producers can be predicted for the coming years).

HOW TO NOMINATE A PRODUCT

Anyone can nominate a product without being an expert, having particular skills, or being a Slow Food member. It is possible to nominate a product from your own area or from other communities or another country. You can nominate a product by filling out the simple form available on the Slow Food Foundation for Biodiversity website.

The nomination form will be evaluated by the national/regional commission, in countries where they exist. The Foundation website lists the countries in which a commission exists and the relevant contact information for getting in touch with local working groups.

These two bodies – the local commissions and the Slow Food Foundation for Biodiversity – will verify that the nomination fits the criteria established for the project. To do so, the Slow Food Foundation collaborates with advisers from different countries.

If nomination forms are incomplete, additional information will be requested from the nominator.

After approval, the next step is to include a brief description of the product in the online catalogue.

At the time of printing this publication, Slow Food members have entered more than 5000 products from 150 countries into the Ark of Taste.

UNISG AND THE ARK OF TASTE ATLASES

Since 2015, Slow Food has been collaborating with the University of Gastronomic Sciences in Pollenzo to give new impetus to the Ark of Taste and increase the number of products being nominated around the world.

The recent partnership with University of Gastronomic Sciences of Pollenzo gave new impetus to the Ark of Taste, as it increased reports from all around the world and developed strategies to promote, disseminate and value its achievements, including releasing atlases of the gastronomic heritage safeguarded through this project. The aim of this initiative is to give visibility to Ark of Taste at local level, presenting the catalogued products, raising awareness about the heritage loss, and promoting a responsible and sustainable consumption

The project directly involves students of the University of Gastronomic Sciences both in the food scouting activities, mainly during the "study trips", and in the design of tools aimed at improving the visibility of the project and its achievements.

To date, Atlases about the Ark of Taste products in Peru, Brazil, Kenya, Mexico, and Albania have been published, and presented at international gastronomic events.

SLOW FOOD

Slow Food is a global, grassroots organization, founded in 1989 to prevent the disappearance of local food cultures and traditions and counteract the rise of fast food culture. Since its beginnings, Slow Food has grown into a global movement involving **millions of people in over 160 countries**, working to ensure **everyone** has access to good, clean and fair food. Slow Food is the umbrella organization responsible for guiding and steering the action of the entire movement, which is composed of over 1,500 local chapters and 2,400 food communities, and reaches millions of people every year.

Slow Food promotes food that is **good, clean and fair for all: good** because it is healthy in addition to tasting good; **clean** because it is produced with low environmental impact and with animal welfare in mind; and **fair** because it respects the work of those who produce, process, and distribute it. Slow Food works to defend biodiversity and to promote a sustainable and environmentally friendly food production and consumption system; to spread sensory education and responsible consumption; and to connect producers of quality foods with co-producers (conscious consumers) through events and initiatives.

Slow Food is committed to protecting traditional, sustainable, quality foods, defending the biodiversity of cultivated and wild varieties as well as methods of cultivation and production. These are all threatened by the prevalence of processed food, industrial agribusiness, and the rules of the global market.

The **Slow Food Foundation for Biodiversity** was created in 2003 to safeguard food biodiversity and gastronomic traditions around the world. It promotes a sustainable model of agriculture that respects the environment, cultural identity, and animal welfare and supports the right of each community to decide what to plant, produce, and eat. Slow Food has become what it is today based on the safeguarding of products.

The Foundation's activity focuses primarily on countries in the Global South, where defending biodiversity means not only improving quality of life but guaranteeing the very survival of local communities.

It finances and coordinates a group of international projects focused on protecting agricultural biodiversity: the **Ark of Taste, 10,000 Gardens in Africa, Presidia and Narrative Labels, Slow Food Chefs' Alliance, and Earth Markets**.

SLOW FOOD PRESIDIA

The Presidia (singular: Presidium), active since 1999, are projects in which Slow Food works with groups of small-scale producers protecting unique regions and ecosystems; recovering traditional processing methods; and safeguarding native breeds and local plant varieties. Each Presidium provides technical assistance to improve production quality, uniting isolated producers and connecting them with alternative markets that are more sensitive to their situation and appreciative of their quality products.

CRITERIA

The Presidia can work to protect:

1. A traditional product at risk of extinction (an Ark of Taste product);
2. A traditional production practice at risk of extinction (e.g. fishing, breeding, processing, or cultivating);
3. A rural landscape or ecosystem at risk of extinction.

To create a Presidium, two aspects must always be verified: environmental sustainability ("clean") and social and economic sustainability ("fair")

WHAT IS THE DIFFERENCE BETWEEN THE ARK OF TASTE AND THE PRESIDIA?

While the Ark of Taste is a catalogue of products, the fundamental characteristic of the Presidia is the relationship with producers and the creation of an initiative to support them. Starting a Presidium means visiting producers, finding out how they work and what difficulties they face, and understanding their social and cultural context and their market in order to succeed in putting a promotional initiative into action.

The Slow Food Presidia directly intervene to safeguard traditional products at risk of extinction (products from the Ark) and represent, therefore, the next phase after cataloguing on the Ark. Naturally, it is not possible to have as many Presidia as there are products on the Ark. The hope is that many other organizations and institutions will also mobilize to save these products.

Slow Food has established 614 Presidia in 79 countries around the world, and there is one Presidium active in Tanzania.

www.fondazioneslowfood.com/en/what-we-do/slow-food-presidia
www.fondazioneslowfood.com/en/nazioni-presidi/tanzania-en

“Biodiversity is the greatest promise for the future of humankind”.

Without it, the foundation for human life on the planet is lost, as is the very soil on which civilizations and cultures have been shaped and formed as the result of human adaptation to the natural environment.

Defending, protecting, and promoting biodiversity is therefore not simply one among a number of choices, advanced by the intellectuals of conservation or by nostalgic environmentalists: It is, rather, the only viable path forward. It is a moral duty that we, the generation that inhabits this historic moment, must take on for those who will come after us and live on this planet Earth, a planet that, today, we are trampling, hurting, and mistreating.

From this point of view, the Ark of Taste, a global project that this book takes up in its Tanzanian context, is an initiative that seeks to create information, knowledge, and awareness about this unique heritage. Through the Ark, not only communities of producers but, dare I say, the whole of civil society, is invited to rediscover and safeguard our agricultural and food heritage, in order to maintain and strengthen our connection to the land that feeds us and will continue to feed us.

Carlo Petrini
Founder and President of Slow Food

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